

**APPENDIX 10.1**  
**Responses to Comments on**  
**Draft Mission Bay Landfill SA**  
**Report**

**SCS ENGINEERS**

March 10, 2006

Mr. Ray Purtee, P.E.  
Project Manager,  
City of San Diego Environmental Services Division  
9601 Ridgehaven Court, Suite 310  
San Diego, California 92123-1636

**RE: Cover Letter to Technical Advisory Committee (TAC) Comment Responses for  
Draft Mission Bay Landfill Site Assessment Report**

Dear Mr. Purtee:

As you are aware, written comments were requested and received from TAC members and from the community in response to the Draft Report referenced above.

These comments and comment responses are submitted herein to the City and hence to the TAC. After review of this document by the City and the TAC, and receipt of their feedback, a revised executive summary will be prepared and distributed to the TAC. After any additional comments have been received, the revised responses to comments and executive summary will be incorporated into the report and a final report will be produced and sent to the two lead enforcement agencies for the landfill: the City of San Diego Solid Waste Local Enforcement Agency and the Regional Water Quality Control Board (an agency within the California Environmental Protection Agency).

This comment and response package includes each set of comments from TAC members and the community, followed by the corresponding responses. The numbers in the right margin of several sets of comments correspond to the numbered responses provided after each set of comments. If the comments were numbered in one complete set by the reviewer (or if section and page numbers were provided), the numbers provided have been used. We have attempted to place the comments in the approximate order received, with the exception of one initial emailed comment from Barry Pulver that has been placed with his other comments.

Should you have any questions regarding the comments, responses, or report, please do not hesitate to call the undersigned at (858) 571-5500.

Respectfully,  
SCS Engineers



Tessa A. McRae, Ph.D., P.G. 6582  
Vice President

Enclosures



## **COMMENT RESPONSES**

As an introduction, it seems appropriate to provide a brief timeline of the study. The initial scope for the study was provided by the TAC, and responded to in our proposal. After the contract was awarded, the review of historical data was conducted and then the draft workplan was prepared and distributed to the TAC. Comments on the draft workplan were received and responses were prepared and compiled in an addendum document with the health and safety plans. The workplan was approved by the oversight agencies. Fieldwork was conducted and input was received from the TAC during the fieldwork phase. After fieldwork was completed, data interpretation commenced. Presentations were made to the TAC on the scope of the HRA and ERA and the scopes were revised based on TAC input. The draft report was prepared and submitted on August 31, 2005, and comments were received until January 31, 2006. Discussion ensued at TAC meetings in the fall, and it was agreed that the comments from the various contributors would be addressed at one time and compiled in an addendum.

### **Addition of Data Evaluation Appendix**

Based on a number of comments regarding quality assurance/quality control issues, a new appendix has been prepared in response. Appendix 4.22 discusses the evaluation of the field and laboratory data and includes four tables. The Appendix is included at the end of this addendum and will be referred to in our responses to several of the comments. Appendix 4.23 has been prepared to respond to one of Mr. Sarabia's comments, and is provided as an attachment.

Other attachments to this document include:

Discussion on thallium issues and associated table.

Table summarizing historical documents regarding waste discharge in San Diego.

Table of information on the groundwater monitoring wells

SCS Engineers personnel matrix

Revised versions of Tables 4.22 and 4.23 as distributed in September 2005.

All of these documents will be incorporated in the final report, either as additional appendices and tables, or within the text of the report.

## Comments on SCS Report on Mission Bay Landfill

Initially submitted by David Huntley to Ray Purtee, 9/8/2005

1. The groundwater level contour maps that are presented in the report are "snapshots" of the water table at specific times (high tide, low tide, during a flood). While those maps are interesting, they do not provide any measure of the net direction of groundwater flow (or direction of solute transport) in a tidally impacted transient system, like Mission Bay Landfill. The effect of those transients are seen by example in wells MBW2 and SCS4, where gw elevations are actually reported as lower at high tide than at low tide ( because of time lag). The correct way to assess net direction of groundwater flow and solute transport direction is to calculate an average water level for each piezometer over the period of a tidal cycle (25 hrs), and contour the resulting average water level. This exercise should be done for several dates through the monitoring period, including days that had extreme high/low tides, times that had moderate tides, and the period of flooding in the SD river. Those maps should either replace or augment the wl contour maps currently in the report.
2. As noted in the meeting, there clearly needs to be a strong executive summary in the front of the report that highlights the findings of the study. This is likely to be the only part of the report that is read by 99% of the people who are faintly interested in the landfill, so a significant effort needs to be invested in those 3-4 pages.
3. There are several "hotbutton" issues that need to be directly and explicitly addressed in this report. Though that might not be done in most or all reports or journal articles, this report is not driven by the normal mechanisms - it is driven by a political need to address this landfill and put it to rest (or remediate if that proved necessary). One hotbutton issue is Thallium (because it keeps being brought up over and over again). Because of that, it needs to be addressed explicitly and separately. The tables in the report (from the most recent sampling) show ND results for Thallium. Yet TAC members and people in public groups keep referring to toxic levels of Thallium in the landfill. So, where does that statement come from? Was there one hit of Thallium in a monitoring well preceeded and followed by ND (that can be discussed in terms of laboratory error)? Was it a soil sample in one area at one depth? Or multiple soil samples. Why did this survey not find it - because it did not sample the same wells or locations? Because, if real, it would be very limited extent (depth and lateral)? The past evidence of Thallium needs to be described and put in context of previous and subsequent gw analyses (if it was a gw hit) or the number of ND soil samples (if it was a soil sample) and proximity to ND values.
4. Clearly, one of the big questions is, based on inventory reports of large amounts of solvent dumping in the landfill, where did it go? There needs to be discussion in the report about this issue. Specifically, the reports of previous dumping need to be cited and volumes and ranges in volumes need to be given, so the readers of the report don't have to rely on outside citations of that information. Second, what are the hypotheses as to why we do not see significant quantities in the gw samples (the 3 that come to mind are a) it was dumped

somewhere else in the "MB Landfill", but the boundaries delineated in this report do not include some other, disconnected areas that were not identified in this study, b) the waste was actually disposed of by midnight dumping (SD river or other convenient locations, or c) it has been dissolved or biodegraded). Each of the hypotheses put forth (those above plus any others you have) needs to be discussed. The possibility of other parts of the landfill outside the area you studied clearly needs to be addressed through your analysis of landfill records (for the time coincident with the solvent disposal records) and aerial photos. The hypothesis that it has been dissolved or bio-degraded can be addressed by calculation. Given the hydraulic gradient and a reasonable estimate (or range) of  $K$ , and the solubility of the solvent mixture, how much mass could have been dissolved from the landfill. Is that anywhere close to the estimated dumping? For bio-degradation, you note (I think) that the methane concentrations are such that methanogenic conditions exist in the landfill, which is ideal for bio-degradation of TCE, TCA, etc. The literature should have some pretty good estimates of rates of degradation, given strong methanogenic conditions. Given those rates, could the mass of solvent have been broken down in the time available? In other words, you need to support your argument that the solvent is not seen today because it has all broken down, not just assume the MB TAC is going to accept that at face value. The same discussion should also address the absence of breakdown products.

5. Does the landfill gas survey in some locations suggest a greater extent of trash than shown in figure 6.1? There are a number of soil gas samples with very high methane (in the 40 % range) that are located outside of the 5 ft contour of trash thickness, yet there are no boreholes to preclude trash in those areas of high methane. Perhaps there should be another contour (zero?) that estimates the extent of trash, based on both the "no trash encountered" borehole info and the soil gas (high methane concentrations).

6. Along the same lines as above, I recall some discussion at the TAC meetings about some very high methane (or  $H_2S$ ) readings in Seaworld. I don't recall if that was part of the SCS data set or part of a study that Seaworld did for the Splash Mtn. If it was not part of the SCS data, shouldn't the other data be incorporated in this report? What do those high values say about the landfill boundary? Are they within the bounds delineated in this report? Do the other data (if it is other data) suggest other parts to the landfill?

7. While I am looking at figure 6.8, what is the purpose of showing the location of the Woodward-Clyde test pits on that figure? Did they measure methane in the test pits? (if so, no values are plotted). If the test pits are unrelated to methane, they should be removed from the figure, as they create the impression of a lot of data, without any data to support that impression.

More comments will be forthcoming.

Dave Huntley

## Additional Comments re: SCS Mission Bay Landfill Report

Prepared by Dave Huntley (10/20/05)

1. Section 5 (Historical Review) seems entirely out of place after the results of field work. Why isn't the Historical Review placed before the results of field work. The extent of the landfill, as estimated from aerial photos, is the framework within which the placement of wells and soil borings (the field work) was determined. 8

2. The discussion of the magnetometer results refers to Sea World Drive, Friars Road, "suspect areas", and several monitoring wells. It would greatly aid this section if those were identified on Figure 4.1. Specifically, the locations of borings and wells (direct push or wells) should be on Figure 4.1 so the reader can understand the geographic relation between the geophysical anomalies and the soil/water samples. The "suspect" are south of Sea World Dr and Friars (p. 45) should be located on Fig 4.1. Finally, the area "East of Sea World Drive" (last bullet on p. 45, where soil cover is thinner) should be identified on the figure. 9

3. It is unclear to me how the soil borings aided in the delineation of the landfill boundaries. For example, B4, located in the landfill has no indication of landfill waste in the geologic log. Nor does B8, also located within the landfill boundary. Obviously, B5, B6, and B7, all located west of the identified boundary, also do not show waste in the log. How was the landfill boundary identified? 10

4. Paragraph 1, page 97 indicates that the water level map shown as figure 4.8 is a time-average contour map. But the same paragraph states that it depicts water levels on 10/16/04 at 12:00 pm, which implies that it is an instantaneous water level map. Which is it? 11

5. The discussion in section 6.2.2 should be combined with discussion in 4.12. Several of the paragraphs (e.g. last paragraph of p. 97) are entirely redundant with earlier discussion. 12

6. 4<sup>th</sup> paragraph of p. 97 does not make any sense or communicate any information. If there is a point to be made there, it needs to be re-written so that it makes that point and supports it with evidence. 13

7. Section 7 is redundant with several sections in the report prior to section 7. This report needs a good editor to entirely re-organize it to eliminate the redundancies. The overall site setting should be read once, not three times in three separate sections. The results of soil and water sampling should be read once, not two times, etc, etc. 14



## Responses to Comments from Individuals

David Huntley, PhD

1. The processing of the tidal survey data is described in Section 6.2.2, and is in accordance with the method that Dr. Huntley describes. It is clear that this should be moved to section 4.12 so that it is explained prior to the first reference to the figures showing groundwater elevations. We apologize for the confusion.
2. We agree, and will revise the executive summary after responses to this document have been received so that it discusses all the major findings of the report.
3. The issue of historical thallium data is addressed in an attachment to this document. The data were reviewed in the context of the research and presentation by Chuck Budinger during his membership of the TAC.
4. As you state, one of the big questions is, based on inventory reports of large amounts of solvent dumping in the landfill, where did it go? The following discussion addresses this issue and will be included in the report. The historical documents provided by the City, and posted on the TAC website, have been reviewed and pertinent information, including volumes and ranges in volumes, compiled in a table which is attached to this document. It should be noted that the wastes described in these documents are primarily acids of various kinds, alkaline solution waste, cyanide wastes, magnesium wastes, and paint and oily wastes. There is only one reference to "combustible cleaning solvents (from dry cleaners)." Therefore, it is possible that the quantity of solvents placed in the landfill is not as great as has been discussed, because the majority of the industrial wastes appear to have been other chemicals as listed above and in the attached table.

Regarding your suggested hypotheses (in *italics*, and our additional suggestion) as to why we do not see significant quantities in the groundwater samples, our initial comments are as follows:

- a) *It was dumped somewhere else in the "MB Landfill", but the boundaries delineated in this report do not include some other, disconnected areas that were not identified in this study.* The extensive review of photographs, maps and other historical documents did not suggest the possibility of other parts of the landfill outside the area studied other than addressed in Section 5 of the draft report. No other City-operated dumps were found in the vicinity of the study area.
- b) *The waste was actually disposed of by midnight dumping (San Diego river or other convenient locations.)* We have no knowledge of midnight dumping operations which, by their very nature, are undocumented.
- c) *It has been dissolved or biodegraded.* Given the lack of information regarding quantities of solvents potentially placed in the landfill, we consider it impractical to

perform calculations to address this possibility. Such calculations would require an extensive number of assumptions, including estimates of the solubility of the unknown solvent mixture. If solvents were actually a small component of the disposed wastes, that would explain the lack of breakdown products.

d) It is still where it was buried. It is possible that the waste is degrading and migrating at such a slow rate that after 40 years large concentrations of contaminants are not seen in our sampling and analysis of soil, sediment, groundwater or landfill gases. If this is the case, the wastes do not appear to be leaving the site in quantities of concern.

5. An estimated zero waste thickness contour can be added to the figure. However, please note that elevated gas concentrations are not themselves indicative of refuse locations, because gas migrates laterally.
6. The implications are that the parking lot will act as an impermeable (almost) cap that will serve to retard (if not stop) vertical gas migration. This is the likely reason that higher methane values were encountered in this area. Please note that elevated gas concentrations are not themselves indicative of refuse locations.
7. The test pits were placed on Figure 6.8 for completeness and easy reference of locations between the various figures. To our knowledge methane was not measured in the test pits. The pits will be removed from the figure for the final report.
8. Section 5 will be moved to become Section 3 in the final report per the discussion at the TAC meeting on December 9, 2005.
9. Figure 4.1 will be revised to include the location of borings and wells, as well as an indication of the "suspect areas" south and east of Sea World Drive.
10. The landfill boundary was primarily identified from the historical data. Many of the borings were installed around the edge of the landfill in an attempt to refine the estimated boundary. If waste was found in a boring, the boundary was moved outside that boring location. However, if no waste was found in a boring the boundary was not moved inside the boring because there are at least three reasons why waste might not have been observed in a boring: a) the boring might have penetrated a zone of soil between the areas of waste, b) the boring might have penetrated some zone(s) of waste but collected no recognizable waste due to decomposition in the landfill, or c) the boring might have penetrated some zone(s) of waste but collected no recognizable waste due to the small diameter of the sampler.
11. The water elevation map (Figure 4.8) reflects the time-averaged data from 12 hours and 25 minutes both before and after the actual time given.
12. As requested during the TAC meeting on August 31, 2005, the title of Section 6 will be changed to Discussion of Results. Section 4 is intended to be description of



fieldwork performed and of the actual results collected. The two sections 4.12 and 6.2.2 will be reviewed to reduce redundancy and check that their contents reflect the intended scope of Sections 4 and 6.

13. The paragraph beginning "The extent of saturated refuse..." will be rewritten to address this comment.
14. During the final report edit, we will endeavor to remove redundancies by reorganizing sections and consolidating discussions where appropriate.

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October 13, 2005

TO: Councilwoman Donna Fry  
Mission Bay Technical Advisory Committee  
SCS Engineers

FROM: Jeffery B. Gordon, MD, MPH

SUBJECT: Comments on Draft Environmental Site Assessment

I must begin by sharing my admiration for the detailed and complete scope of work completed by SCS Engineers. In my personal opinion they have satisfied my hopes that they would be comprehensive, technically sophisticated, scientifically objective, and articulate. Also I think we must admire their patience in participating in such a prolonged and open dialogue with the TAC as was necessary to preserve the integrity and credibility of the project. I do not think the City and its residents could have had a better analysis of the condition of the landfill under any other circumstances. In this context please review my following comments on the draft report, some of which may be relevant, some marginal, and some merely editorial.

1. I assume that because this is still a "draft" that there is no "Executive Summary." One is definitely necessary as important pertinent findings are scattered throughout and are hard to find in such a long and complex text. This should include such items as the absence of pertinent COPCs, the presence and importance of methane, of arsenic, etc., the results of the HRAs and so on.

2. There should be some discussion of future land use possibilities in the Executive Summary which must be developed in cooperation with the TAC and this topic should have its own section in the Report itself.

3. Section 1.6 ff should be rewritten by someone who uses English as their native language. For instance on page 9 all three paragraphs of 1.6 have words and phrases which are very confusing to me (such as "overall regulatory requirements...in the context of," or "encompass potential requirements," or "what may be considered to be required." On page 15, the largest paragraph consists of essentially one sentence which takes up 19 lines of text and also makes no sense to me.

4. Section 6.1.2.2 and Map 6.2 show that at some places the cover over the landfill is only 1.5 feet deep. If the TAC agrees with the recommendations in Sections 10.3 and 11.0 we should initiate a discussion about funding and implementation.

5. What are the implications of the newly established fact (Section 6.1.2.3 and Section 6.2.1.4) that the Eastern part of Sea World's parking overlaps the Western part of the landfill? The observed values of methane in subsurface gas were very high in this area (see Section 6.4.1, 7.2.5 and Maps 6.2 and 6.4) and discussed in Section 8.4.4? I would tend to agree with the prolonged discussion in Section 10.4, but the TAC should discuss the conclusions specifically.

6. What does it mean on page 103 (Section 6.5.1) to say "Human Health Risk Assessment and Ecological Risk Assessment...has rarely been applied to old or new landfills?"

7. Section 6.7.3.1 contains some very significant observations which must be highlighted

or repeated elsewhere, to wit: "Overall the analytical data show that either significant degradation of HVOCs has occurred...." And "there is a potential for future releases to occur from sealed drums should they remain intact." By the way I am confused about the results of the Geophysical Survey (Section 4.4) did it identify any indications that drums existed or was it even capable of doing so?

8. Sections 6.6, 7.2 and associated maps and Section 4.7.3 ff all seem very important to me in so far as landfill waste was/is located up to 10 feet below ground water level. The conclusions in Section 10.5 are very brief and to the point since no VOCs or SVOCs were found in ground water. It would seem appropriate to include here some (?speculative) discussion of whether possible elution of COPCs occurred in the past.

9. Section 7.2 refers to COPCs in sediment and soil summarized in Section 6.3 but that Section says "the surface soils of the Site contain no COPCs.." These two Sections are not consistent, especially since 7.2 contains a long list of COPCs.

10. It comes to mind that the glossary of abbreviations might be put at the beginning of the report on a fold out page. Also it seems to me that certain tables might better be integrated with the text.

11. I was finally motivated to use the CDROM to look up Appendix 8.3 when the RfDs were discussed in Section 8.4.1. After reviewing the Appendices. I think both 8.2 and 8.3 with their tables and toxicities deserve to be placed early in the main body of the Report itself to explicitly lay out for the lay reader the complete list and types of COPCs that were looked for and the standard accepted toxic dose levels. These Appendices are duplicative of Table 9.1 which although it refers only to COPECs should be omitted and COPECs should be notated in 8.2 and 8.3. Again I would note that as a reader my attention was not brought to consider the initial list of COPCs or COPECs until Section 8.4.1 or 9.2.3.2.

12. Before I forget to mention it the maps are completely great and wonderful

13. Sections 8.4.2 and 8.6.1 raise the importance and impact of extremely high mercury levels found in landfill soil. From the discussion of this finding at the TAC I seem to recall this is actually based on data from Woodward and Clyde. This should be discussed further. Is this observation reliable? Why was it accepted? It should explicitly be compared to SCS's mercury data. Do we have any idea where the mercury came from? What was its actual chemical form? Are any other data from Woodward and Clyde accepted into this Report?

14. Section 8.5 discusses the Precautionary Principle. The second paragraph needs a grammatical correction: "In other words, if some activity (or for example, a chemical *exposure or use*) may potentially...."

I would suggest there is a fifth component of the precautionary principle which is omitted from the draft text and it is important to add it. I would state it as follows:

"Calculation of potential risk can only be made using currently accepted parameters of empiric or estimated toxicity.(See listing in Appendix 8.3) It is understood that such levels for many COPCs are adjudicated through a process that involves both scientific research (which, at least initially, may be conducted largely by the manufacturers of the substance itself) and a regulatory process that must involve political and economic concerns. The parameters used in this Report are generally accepted today. They are nonetheless to some extent remain uncertain. In addition, the analytical data described in any analysis must consist of the best available sampling of the site under investigation. Any sampling method is subject to technical, financial, and statistical limitations which may induce error or omissions. (See Sections 8.5.5.1.and 9.4) The Precautionary Principle recognizes that due to advances in technology, innovative and ongoing scientific studies, and recalculation of political and economic concerns that toxicities, RfDs, TRVs, LOAELs, and NOAELs etc. are revised from time to time and are often made more stringent. (One may reflect on recent discussions about lead, mercury, and phthalates, for

example). Thus the Precautionary Principle instructs us to make conservative recommendations about future use and exposure which should nonetheless be consistent with the results of this study”

15. In my opinion the first sentence in Section 8.5.1 expresses a misconception about the Precautionary Principle and should be omitted. It is not restricted to a process for analyzing only new and future possible risks. It does apply to the MB landfill as an alternative way to conceptualize human and environmental risk assessments, given whatever data is developed empirically. With regard to Section 8.5.3 this should be revised if my suggested addition (No.14 above) is integrated into the narrative.

16. Section 9.2.8 refers to “the presence of COPECs identified above...” Table 9.1 should be referenced.

17. I cannot find where TRVs are defined and TRVs are not referenced in the acronym list (13.0).

18. In Section 9.3.2.2. TRVs are said to come from toxicity studies based on reproductive endpoints. Are there not some based on carcinogenicity or other endpoints?

19. Section 10.2 says “New COPCs have been discovered as presented in Table 4.7. I cannot find Table 4.7. It would also seem that each “new” COPC identification would require some explication.

20. All parts of Sections 10 and 11 should be discussed in detail by the TAC. We should set a process for funding and implementation of any adopted recommendations.

21. Section 11 should include some recommendations about future land use and or landscaping possibilities.

*Dr. Jeffery B. Gordon*

We are most appreciative of your general comments.

1. We agree that an Executive Summary is a very important part of the report. We will revise the draft executive summary after responses to this document have been received so that it discusses all the important pertinent findings of the report, including the absence of pertinent COPCs, the presence and importance of methane, of arsenic, etc., the results of the HRAs and so on, as you suggest.
2. As discussed in the TAC meeting on October 21, 2005, as consultants we can only state that there may be issues to be addressed if certain types of construction are proposed. It should be noted that any change in land use requires input from the City of San Diego Local Enforcement Agency (LEA) and the Regional Water Quality Control Board (RWQCB).
3. This section will be rewritten to improve the clarity.
4. This is already being addressed by the TAC.
5. The implications are that the parking lot will act as an impermeable (almost) cap that will serve to retard (if not stop) vertical gas migration. This is the likely reason that higher methane values were encountered in this area. We anticipate that the TAC will address this issue during the coming months.
6. This statement will be revised to indicate that HRAs are usually applied to landfills when associated with CEQA and potential landfill development and/or control system permitting.
7. We will include the observations from section 6.7.3.1 in the conclusions section of the report. As discussed in section 4.4.3.1, the geophysical survey indicated some areas of stronger magnetic response and described possible sources including random occurrences of metallic debris, linear features related to the parking lot lighting and utilities, and cultural features (utilities, fencing, etc.) associated with the roadways. It is not possible to tell whether metallic debris represents drums or other metallic objects disposed of in the landfill.
8. As you indicate, discussion of whether possible elution of COPCs occurred in the past would indeed be speculative. Given the lack of detailed information about what was placed in the landfill and at what time in its development, it is very difficult to provide an opinion on what did, or did not, happen to COPCs that might, or might not, have been present in the deepest parts of the waste. However, the evidence that we do have suggests that waters from large flood events tend to flow through the landfill from south to north, and raise the elevation of the water thus causing temporary saturation of waste at shallower levels.



9. The sentence at the end of section 6.3 is erroneous and will be amended by adding "..... at concentrations greater than the California Human Health Screening Levels." As can be seen in Table 4.14, in addition to the metals, there are isolated detected concentrations of acetone and two polynuclear aromatic hydrocarbons in the surface soil samples. Section 7.2 also includes discussion of soil samples collected from soil borings at greater depths within the landfill, whereas Section 6.3 only discusses surface soils and sediments, which explains the discrepancy in the number of COPCs mentioned. The list provided in Section 7.2 will be rechecked for accuracy.
10. The glossaries provided are specific to Sections 8 and 9. Is the intention of this comment to suggest that you would like an enlarged glossary? If so, we would be pleased to discuss what you would like it to contain and how we can make it most useful to readers. With regard to tables, we included in the text those that were of a size that we felt was appropriate. We think that it is more useful to include all the larger tables of data in one section after the text.
11. Normally a COPC list is provided in an HRA after screening against background. For the Mission Bay HRA there was no screening against background so any chemical detected was included in the HRA and the normal COPC list was omitted. However, in this case the table of toxicity criteria can be used to indicate the final list of chemicals included in the HRA as proposed in the comment. The HRA text will be revised to reference the toxicity criteria tables for the HRA COPC list.

Determining the initial list of COPECs requires first conducting a couple of screening steps. These steps need to be discussed in the text before the reader can be referred to the list so that the reader understands how the initial list was developed. The ERA text explicitly refers the reader to tables showing the initial (Table 9.1) and final (Table 9.3) COPEC lists.
12. Thank you for your kind words.
13. Because high concentrations of mercury were found in several instances at the Mission Bay landfill we do not consider these to be spurious results. There is no reason to believe it is unreliable. Mercury was measured as total mercury. Due to the long history of the landfill and multiple types of users, combined with poor historical records, it is impossible to say, with any degree of certainty, what the source of the mercury is. All soils metal data generated by Woodward Clyde were used in the report.
14. The minor editorial change will be made. A paraphrased version of your proposed text will be added to the discussion of the Precautionary Principle (PP).
15. A key component of the PP is that when a new chemical is manufactured or a new project is proposed that may impact human health or the environment, less-risky alternatives to the new chemical/project should be evaluated. The purpose is to see if one of these alternatives might be able to fulfill the need without the added risks of



the new chemical/project. These alternatives need to be evaluated before the new chemical is manufactured and released into the environment or the new project is built.

The source of the health risks in this case is the landfill. The PP can certainly be applied to the way in which health risks are evaluated but it cannot be applied in terms of helping to decide an alternative to the original source of health risks since the landfill has already been built. However, section 8.5.3 will be revised to incorporate a version of the suggested text as this suggestion is certainly applicable to the risk assessment.

16. The minor editorial change will be made.
17. TRVs are defined in Section 9.1. It will be added to the acronym list.
18. Carcinogenicity is not an endpoint used for ecological receptors at this point in time. Reproductive endpoints are used because they tend to be the most sensitive indicators of toxicity and have the potential to affect wildlife populations, not just individual animals.
19. This should refer to Table 4.5 (on page 39), not Table 4.7.
20. This is already being addressed by the TAC.
21. As discussed during the TAC meetings, this is outside our scope as consultants, and will be addressed by the Mission Bay Park Master Plan and by the oversight of the LEA and RWQCB.

>>> "Pulver, Barry" <Barry.Pulver@sdcounty.ca.gov> 09/01/05 12:48 PM >>>  
Ray,

Last night I started reviewing the draft report. I will provide the TAC with my comments when I have completed my review and will not piecemeal my comments. However, I came across one item that I would like to have resolved sooner rather than later.

Table 4.22 lists and compares groundwater test results to the PHGs, Ocean Plan, and PRG limits. The left side of the table lists the PHGs, Ocean Plan, and PRG limits in units of ug/l (parts per billion). The right side of the table lists the groundwater test results with metal concentrations in units of mg/l (parts per million). For tables that compare concentrations the units should be the same, so I started converting the metal concentrations from mg/l to ug/l. The conversion factor is 1000 times so the 0.004 mg/l Arsenic concentration for the sample collected from well MBW1 would be 4 ug/l, which exceeds the listed PHG of 0.0040 ug/l (the arsenic concentration for this sample was not bolded to indicate that it exceeded the most stringent limit). As you recall, yesterday Councilwoman Frye made the point that the PHG and PRG is for drinking and tap water and not directly applicable to groundwater and/or surface waters of Mission Bay. However, converting the listed 0.010, 0.016, and 0.012 Arsenic concentrations for wells MBW3, MBE4, and MBW5 from mg/l to ug/l results in concentrations that exceed the listed Ocean Plan limit of 8 ug/l, which could be considered a more relevant standard.

This apparent error in unit conversions is carried over to Table 4.23 where the sample results collected by SCS using the "clean hands dirty hands" sampling method and ultra low concentration testing to the test results obtained by EMCON. For example, the table lists the Arsenic concentration for well MBW1 as 0.040 ug/l (using the value of 0.004 mg/l from Table 4.22 the concentration should be 4 ug/l).

I have not been able to plow through the appendices to find the lab results to find out if the values listed on Table 4.22 are correct, nor have I checked to see what values were plugged into the risk assessments. Because there has been at least one newspaper story about the study if the error on the conversions per Tables 4.22 and 4.23 effect any of the conclusions it should be resolved as soon as possible.

Per the draft report the groundwater monitoring wells have only been sampled once. Does EMCON sample these wells as part of the semi-annual groundwater sampling? If they do it would be helpful to have those results.

Regards,

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Comments on Draft Report Environmental Site Assessment of the Mission Bay Landfill,  
San Diego, California

Barry Pulver

My approach to serving on the TAC was to provide my knowledge and expertise to help the City obtain the most bullet-proof and defensible report that they SCS could provide. After so many years of doubt, concerns, and questions regarding the risks posed by the Mission Bay Landfill the citizens needed, no deserve such a report in order to fully understand the risks, and answer the question once and for all. As such my comments are not meant to tear apart this report, but to help to become better.

I approached my review in the same manner that I have reviewed documents for work (as a consultant, regulatory, and discharger). I always start at the back to review the supporting documents to make sure the data is valid to make the interpretations in the report. As such, some people may feel that my comments are “nit picky” but they are part of the review process and the goal to make sure the report is near perfection.

I am somewhat concerned that there may be some irritation with comments on areas that were discussed during the TAC meetings. However, it should be recognized that this is the first time the TAC members have had to review the entire data set. Now that we can see how the information relates to each other we are in a better position to evaluate the data and preliminary findings and the report.

As I reviewed this report I kept thinking about the parable told by the Buddha about the blind men and the elephant. As each blind man described the elephant differently I am sure each of us will find different items to comment on. This should result in lively and interesting discussions.

One last comment. Although I have spent considerable time reviewing this report and making comments, I am sure that this is not the last of my comments. Additional comments will arise out of the forthcoming discussions. I anticipate that the discussions will be a trying time for everyone, but we should keep in mind that the end result will be an excellent document that will benefit the citizens of our City and the visitors who enjoy Mission Bay.

## **Text**

### *General Comments*

Where did that chemical go? - The report needs to address the apparent discrepancy between the volume of hazardous wastes discharged at the landfill and the relatively low concentrations of VOCs in groundwater and soil gas.

Description of Limits of Landfill – Somewhere in the text there should be a discussion of what is meant by the limits of the landfill. On the figures there is a colored solid line that is labeled interpreted landfill boundary (figure 1.1) or landfill delineation. It is not clear if this line represents the horizontal limits of the landfill. This definition is contradicted by soil borings that

are located within this line be do not contain waste. It is possible that there could be area within the landfill property that does not contain waste because of the irregular method used to dispose of waste. If this is the case then there should be some discussion or disclaimer to this effect.

Delineation of Landfill Limits – Based on the extensive amount of work conducted, is there any difference between the pre and post investigation landfill limits?

## **Section 1**

Page 2 describes other environmental investigations being conducted at Mission Bay but does not discuss how this altered the planned investigation.

Because of the multidisciplinary effort taken to produce this report a list of individuals involved in the fieldwork, data interpretation, and report preparation should be listed with their responsibilities and qualifications. This list should not be limited to task leaders, but even include those who did grunt work. This would be a good presentation of the level of effort undertaken to produce this document.

## **Section 2**

- 2.1.2 States that “a revised SCM is presented in Section 7 of the Report”. It might be a good idea in Section 7 to also discuss how the SCM changed due to the work that was completed.
- 2.2 For clarity the term groundwater monitoring wells should be used instead of monitoring wells as it is undefined as what media is being sampled.

## **Section 4**

- P 38 States that DQOs were used in the investigation. I thought that Hiram asked for a copy of the DQOs and there were not available. The DQOs referenced in this section should be included as an appendix.

The Data Quality Assessment that is referenced in this section should be included as an appendix as it appears to be an important data validation procedure.

It is somewhat misleading to state that the TB, FB, and Dup Samples were collected during this investigation then in parenthesis state that it was only for groundwater samples analyzed for metals. Should state that ...were collected during the metals analysis groundwater sampling event...”

Statement that FB, TB, and duplicate sample are presented on Table 4.21. There are four duplicate samples presented on this table, DP1, DP2, DP3, and DP4.

For a project of this magnitude and importance I am surprised that there is not a more detailed section on data validation. This would include an assessment made by SCS on

all the QA/QC testing done by the lab, and evaluation of holding times, and a discussion of any variances and flags and how it might affect the data.

P 40 Would be nice to include copy of H&S Plan as appendix.

States that LFG may be generated during the investigation procedures. Probably better to state that LFG could be released or encountered during the investigation (I don't think that the work would generate LFG).

Could air monitoring records be included in appendix?

P 58 States that Unified Soil Classification System was used to describe soil samples. However, the descriptions of some of the samples are not consistent with this method.

P 61 Groundwater grab samples are a reconnaissance sampling technique. As such it may not be appropriate to compare them to PHGs, Ocean Plan, and PRGs.

P 70 Groundwater sampling from wells. The results of the stratification study indicates the presence of a halocline with an active shallow zone and a deep stagnant zone. On page 161 there is a recommendation to reset the depths of the wells to sample the shallow active zone. Were the samples collected from the wells, the data which was used in the HRA collected from the shallow active zone? If not, should the wells be resampled and the risk assessment redone?

P 79 The report states that the well survey was conducted by a licensed land surveyor. However, the well survey report included in Appendix 4.20 does not indicate that it was conducted by a licensed land surveyor. It does list the company but not the name or license number of the licensed land surveyor.

## **Section 5 Did not review**

## **Section 6**

P 91 The report states that the lateral limits of the landfill is depicted on Figure 6.1. Not really. There is a yellow line that is labeled "Landfill Delineation" and isoconcentrations of estimated thickness of trash, with intervals of 15', 10', and 5'. There is no line depicting 0' or edge of landfill. There are borings located outside of the 5' thickness interval and the yellow "Landfill Delineation" line that are noted to have no trash. This map does not clearly indicate the horizontal limits of the landfill.

P 93 Is the average cap thickness an area weighted average or just a simple average of all the data points?

P 96 Were any grab groundwater samples collected from within the area of saturated refuse?

It is stated that groundwater levels are affected by the saturated refuse. In what way are groundwater levels affected and what is the mechanism for it?

With all the information obtained from the tidal study, the storm event study, and the salinity gradients can any opinions regarding the placement of the wells and the screened intervals be made whether the wells are ok or if additional ones are needed?

P 97 The reference to section 4.16 for additional details and analyses specific to the tidal monitoring is incorrect. Section 4.16 is titled *Disposal of Investigation-Derived Waste*.

P 100 There is a discussion of COPCs and that the only COPCs detected were metals. It is stated that on page 118 it was stated that the arsenic CHHSL is below the detection limit used for the surface soil sampling. Even if arsenic was not detected it could be present in concentrations that exceed the CHHSL.

P 101 Conventional wisdom is that landfills run out of organic matter to produce methane within 30 years of closure. This landfill seems to still be producing methane and was closed 46 years ago. Is the landfill gas model applicable to the unique nature of this landfill? Did the landfill gas model reproduce known conditions at the landfill for gas generation?

P 102 What is the purpose of the discussion about what is put into municipal landfill? I thought the purpose of this investigation was to look at the Mission Bay Landfill not municipal landfills in general. There seems to be significant historical data to suggest that a lot of industrial waste was deposited at the Mission Bay Landfill.

In order to estimate what might leak out it is important to know what is in the landfill.

“Non-native substances”? Do you mean waste, trash, refuse?

I believe if there is a leak from the landfill into surface or groundwater the Regional Board will call it a discharge.

P 103 The statement that “the ability to monitor any significant release of hazardous contaminants is the way by which all modern landfills are scrutinized” is a simplification. Firstly, not only are “hazardous contaminants” (I assume this means solvents, pesticides, and the usual man-made chemicals) but inorganic compounds and the byproduct of decomposition, such as chloride, are used. Furthermore, statistical evaluations are frequently used to determine whether a detection (not only significant detections but also minor detections) are needed to determine if a discharge had occurred and the landfill failed.

P 108 I thought there was a DNA study completed within the past several years that suggested that the high fecal coliform was from seagulls. You might want to contact Art Coe or Pete Michaels of the Regional Board to find out about this.



- P 108 The discussion in Section 6.6 does not really show that HVOCs have rarely been detected or below drinking water standards.

## Section 7

- P 111 Listed figures should be in numerical order

- P 111 Figure 6.1 is referenced to show thickness of refuse and fill within the landfill. However, the title of the figure is “Estimated Landfill Waste Thickness” and explanation only references refuse thickness. Should use consistent terminology.

- P 111 Figure 6.4 is referenced to show elevation of base of waste but figure references elevation of base of waste. Should use consistent terminology.

- P 111 Figure 6.8 is referenced to show methane and hydrogen sulfide concentration recently measured. These measurements were made over a year ago. Is recently the correct term to use or should the date of the measurements be given?

- P 118 The report states that the arsenic CHHSL is below the detection limit for arsenic used in this investigation. Is it possible to use lower detection levels? Is so, why weren't they used? Did the DQOs address this?

Although the concentration of naturally occurring arsenic may exceed the CHHSL for arsenic, and that both the US-EPA and the CAL-EPA will not require cleanup beyond background, the City, as the property owner, has an implied if not explicit responsibility to make sure that areas that they allow public access is safe or at least the public is notified of the potential hazard. For example, riptide signs and warning are common at our beaches, as well as rattlesnake warning signs at trail heads. A better safe than sorry approach (wink, wink, nudge, nudge – the Precautionary Principle) might warrant a discussion here.

Furthermore, this US-EPA policy may be changing in light of recent events regarding the cleanup of naturally-occurring asbestos in El Dorado Hills, California (<http://yosemite.epa.gov/r9/r9press.nsf/268400f6f4b727f288256b6100659fe6/4e29a6f27b6c41bb88256ef4007a04c0!OpenDocument>). I am not familiar with all the aspects of this cleanup action, or the effect that it might have on other sites where a naturally occurring substance is associated with a human health risk, but I think that it would be within the bounds of the Precautionary Principle to evaluate what effects changing regulations and policies may have decisions that will be made at this site.

- P 119 I recall that the APCD limited their testing to what they referred to as Toxic compounds, which I recall were VOCs. The statement that only “trace concentrations of toxic compounds were detected” can be interpreted to mean that methane and sulfur dioxide (which has been raised as concern) was not detected, but I think they were not tested for. If my understanding is correct this section should be re-written.

Didn't the APCD state that the detected "toxic compounds" (I encourage not using the term toxic as it commonly misused) at the site were not greater than the background ambient air sampling station in Kearny Mesa. The discussion of results should include this comparison.

The report stated that "localized hot spots of toxic compounds did not exist at the surface of the landfill." Are there regional or large areas of hot spots of toxic compounds?

The report states that "the air above the surface of the landfill consists mainly of oxygen and nitrogen and some carbon dioxide." If nothing else the money spent on this project is well worth it to find out that the air above the landfill consists mainly of oxygen and nitrogen and some carbon dioxide. This is truly an earth shattering discovery. Has a manuscript been sent to Science or Nature regarding this discovery? Sorry for the sarcasm, but it is funny. Rather than stating that the gases that make up the Earth's atmosphere were discovered above the landfill it would be better to state the COCs that were not detected, or at concentrations that are not an issue.

P 120 It is stated that all arsenic detections exceeded the CHHSL. On page 118 it was stated that the arsenic CHHSL is below the detection limit used for the surface soil sampling. Was the same detection limit used for the sediment samples? If so, a similar disclosure should be made.

## Section 8

### General Comments

- I did not check the calculations. It might be a good idea to include something about the QA/QC methods that were used to validate the calculations and results. Maybe have some one spot check the calculations?
- The groundwater monitoring wells were only sampled once. A lot of decisions will be made on the risk assessment that is based on a one-time sampling event. Is this acceptable to conduct a risk assessment using this one shot data? Would it be more representative to collect additional samples to confirm the results?
- Were the groundwater samples collected from the "active" groundwater zone as described in the report?

P 123 Things got a bit confusing and I lost track. Did OEHHA ever send a letter stating that they were satisfied with the responses that were sent to them and agreed with the approach?

I thought the LEA requested OEHHA review of the HHRA. Therefore their review wasn't directly requested.

New thought on pathways, what about swimmer breathing VOCs partitioning from bay water?

- P 124 Data Sources – Although it is implied, did the Risk Assessment folks make any professional opinion whether the location and number of samples collected are adequate to support the Risk Assessments. For example, rather than discrete soil vapor samples the samples were composited (each sample analyzed consisted of five discrete samples from different locations and different depths that were composited into one sample). Is this an acceptable method for the collection of soil gas samples for the intended uses and pursuant to applicable guidelines? It might be a good idea to state so in this section. Were the groundwater grab samples included in the HRA? This is typically considered a reconnaissance sampling technique only.
- P 125 Although the use of all inorganic compounds whether or not they are naturally occurring may overestimate the health risk due to the landfill, it does not overestimate the risk due to these compounds at the site to the receptors.
- P 125 Is the use of setting EPCs equal to the 95% upper confidence limit of the arithmetic mean consistent with the Precautionary Principle? Does the data distribution support the use of this statistical method?
- P 127 It is stated on page 121 that “incidental worker exposure to groundwater impossible should invasive activities occur. This could include accidental ingestion, exposure to vapors associated with groundwater, or dermal exposure.” This is not included in the exposure scenario for construction worker listed on page 127. Please explain why this was excluded.
- P 132 Bottom of Page – there is a statement “...are shown in Appendix 8.3, Tables 8.3.1 and 8.3.2...” Because there is a Table 8.3 in the text there could be some confusion whether the referenced tables were excluded. Perhaps this could be reworded “... are shown in Tables 8.3.1 and 8.3.2 included in Appendix 8.3...”).
- P 132 It is stated that non-cancer risk conclusions are discussed below in Section 8.3.2. Please correct type to state correct section – Section 8.4.2 [bold added for emphasis].
- P 133 Table 8.7 is referenced for HI values. There are two rows listing Construction Worker. It is not clear why there are two rows, with two different HIs. The title of the table is Total Risks, so shouldn't there just one for Construction Worker with the total HI for all COPCs?
- P 134 Not only can methane displace oxygen indoors and be an asphyxiate; it can happen in any confined space, indoors or outdoors, such as a sump, a trench, or a pipe. The statement that this is unlikely to occur except indoors is not accurate.
- P 135 The report states that “the limited soil gas survey conducted as part of this characterization does not rule out the possibility that pockets of much higher

concentrations of hydrogen sulfide may exist in the landfill.” Does this apply to the other gases tested for as part of this investigation?

P 135 The referenced DTSC study seems to be of soil in the Los Angeles area. Did DTSC present any geographic limitations where the results of this investigation is applicable? Is the geology of San Diego and the watershed of the San Diego River similar enough to the Los Angeles area to make this assumption of the natural occurrence of arsenic valid?

P 135 Although arsenic can be eliminated as a COPC per DTSC guidance, does that mean that there is no risk due to the presence of arsenic at the site?

P 135 We get it that you have been tasked to do something out of the ordinary and it may not be easy. Yes, it is not part of a “standard risk assessment” used to risk away the problem. The action at hand is what to do with the landfill, what land use restrictions, what institutional control needed to be used, if any, to adequately protect human health and the environment. Please remove all negative editorial comments about using the Precautionary Principle and use a positive approach. Alternatively, just state that you feel it is not appropriate to use and be silent on the issue.

*Exploring Alternatives to Proposed Action* – Yes, there is an action, what is the City going to do to protect human health and the environment.

*Placing the Burden of Proof Regarding the Relative Safety of the Proposed Action on the Proponents of the Activity* – Please explain how the MB HRA is consistent with this aspect.

P 138 Uncertainty Analysis – good discussion of possible problems with the data and data evaluation. But, more importantly, how does this effect the interpretation of the data in order to make decisions on what to do next. For example, could the “considerable spatial variation in the landfill contamination” mean that there could be higher concentrations, and if so what effect might this have on the HRA?

## **Section 9 – Did not review**

## **Section 10**

P 155 The report states that the lateral limits of the landfill is depicted on Figure 6.1. Not really. There is a yellow line that is labeled “Landfill Delineation” and isoconcentrations of estimated thickness of trash, with intervals of 15’, 10’, and 5’. There is no line depicting 0’ or edge of landfill. There are borings located outside of the 5’ thickness interval and the yellow “Landfill Delineation” line that are noted to have no trash. This map does not clearly indicate the horizontal limits of the landfill.

P 156 The Regional Board and the LEA have regulated this landfill for some time. A water SWAT was prepared and submitted to the Regional Board. There are WDRs for this site.

Did the SWAT have any conclusions/recommendations for the Cap. Has the Regional Board or the LEA issued any requirements for the Cap?

- P 156 Would the use of the Precautionary Principle suggest that even though you feel that the Regional Board and the LEA would not require any improvements to the cap that something should be done? A 1.5 foot separation between the surface and buried trash sound low. In areas not covered by pavement rodents and other burrowing animals could dig into trash and bring the trash to the surface. If they dig into the trash the hole will be conduit for landfill gas to discharge to the atmosphere. Could some minor grading be done to even out the cap thickness?
- P 157 Any potential for gas migration along utilities? How does age and depth of landfill reduce the horizontal extent that methane can migrate? Doesn't geology have some effect, such as the permeability of the soil, are there highly permeable soils there? Rather than speculate why the Regional Board and the LEA have not required perimeter gas monitoring wells, how about asking them, they are usually present at the TAC meetings. Was an air SWAT ever done for this site?
- P 157 Don't forget the only foolproof method of preventing gas migration into buildings, don't build anything there. In many sections regarding the risk of mercury to construction workers you state that due to the high methane construction is not likely. But the section on how to protect buildings from methane seems like you think that building is possible. If you are going to use the rationale that building restrictions means that there is not complete construction worker pathway then, perhaps, you shouldn't also provide means to build on the site. Isn't there some building, maybe a restroom, built near the landfill by the boat ramp? Has anyone done methane testing there? If so, what are the results.
- P 158 The section on solvent and chromic wastes needs to be expanded to give a very strong explanation why the data collected seems to be at odds with the reported historical uses of the landfill.
- P 159 Whenever the cancer risk is presented there is a comparison to the "safe" level. I am not sure what is reason for the comparison, it either is above or below the "safe" level. The comparison shows an order of magnitude increase in the cancer risk from the "safe" level. This sounds significant.

## Section 11

Agree that cap should be improved. But, it is interesting that on page 156 there are no statements that the cap needs work, in fact it sounds like the cap is just fine and neither the Regional Board or the LEA would require improvements. Why the change in heart?

What about selective removal of waste with high mercury concentrations to reduce the risk due to mercury, which seems to be a risk driver?



I can't find any information regarding the existing gas monitoring system at the landfill. Why wasn't this data included in the findings?

How about adding the new wells to the existing groundwater monitoring program.

After the wells are sampled from the "active zone" should the data be evaluated and a decision made whether to redo the risk assessments using the new data?

Why should low flow sampling methods be conducted?

## **Figures**

### **Figure 4.2**

- Add data to figure.

### **Figure 6.8**

- This figure would be easier to read if the only borings/wells presented on the map are the ones where field measurements were taken.
- Add sample designations.
- Typo on note "abserved".
- The light green isoconcentration line for 45% methane is very hard to read. Please use a more distinctive color.
- There is no control for closing the 15% contour near B17, MBW-2, and MBW-3 other than not wanting it to seem to extend past the limits of the landfill.
- There is no control for closing the 30% contour near northwestern corner of the landfill other than not wanting it to seem to extend past the limits of the landfill.
- There is no control for closing the 45% contour near B17, MBW-2, and MBW-3 other than not wanting it to seem to extend past the limits of the landfill.
- Why doesn't the 15% contour include the data point to the northeast of B3?



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**Tables (I understand that Tessa checked and revised the Tables. I have not had time to look at the revisions)**

Table 4.1

- Title of table does not match title in Table of Contents

Table 4.6

- Title of table does not match title in Table of Contents.
- Foot note 1 states that bold indicates percentages of methane and carbon dioxide greater than 40% and 30% and concentrations of H<sub>2</sub>S in excess of 1 ppm. What is significance of these thresholds? State so in footnotes.

## **APPENDICES**

### **Appendix 1.2**

#### Questions Oct. 11, 2004 Response Letter to Regional Board

The letter states that at least two wells will be drilled through the waste near the ends of the former channel and that samples would therefore groundwater samples would be collected from below waste. This response was provide as the rationale for not having to drill deep wells as suggested by the Regional Board to address deep vertical migration of contaminants from the landfill. As indicated on Figure 4.3 these two wells are SCS1 and SCS3. Trash is not indicated on the logs for these two wells, nor is there any indication that trash was encountered during the drilling of the wells. Because waste was not encountered in wells SCS1 and SCS3 is the City required to install deep wells to satisfy the Regional Board's concerns about deep migration.

The letter also states that it would be premature to install deeper wells until the tidal study has been completed. Now that the tidal study has been completed there should be a conclusion, based on the data to date and specifically tied to the results of the tidal study as that was stated to be the key data, in the report regarding the need for deeper wells.

The letter states that investigation will be a preliminary hydrogeologic investigation of the vertical and horizontal migration of VOCs and that the report will include recommendations for additional work if needed. The scope of work as described on pages 5 and 155 of the Report does not specifically include an investigation to the vertical and horizontal migration of VOCs. The scope does include determination/identification of the average and maximum concentrations

of any chemical contaminants and distribution within the landfill boundary. There are not specific conclusions regarding whether the extent of VOCs have been defined or if additional wells are needed.

The letter states that the stormdrains and sewer lines will be evaluated as contributing factors to the contamination in Mission Bay. Has this been done and addressed in the text?

### **Appendix 1.3**

I am a member of the TAC as an individual, not as a representative of the County of San Diego. I attend on my own time and am not being compensated by the County for my involvement. I work extra hours to make up the time that I attend the TAC meetings. Please remove the reference to the County of San Diego.

### **Appendix 4.5A**

Was there a cover sheet or transmittal letter with the geophysical report? The copy of the report in this appendix is undated and unsigned. Were California Professional Geophysicist involved in the work as the in-charge professional? Was one needed?

On page 7 of the geophysical report it is stated that many magnetic anomaly pairs were present and could be the result of surface features such as poles, utility boxes, etc., and that ground truthing needs to be conducted, and if they cannot be correlated with surface features or buried utilities they are interpreted to represent buried metal objects related to the landfill operation. Did the ground truthing take place and were the anomaly pairs shown to be related to surface features and/or buried utilities?

Page 8 of the geophysical report includes geologic interpretations – the types of geologic material at the site based on the results of the geophysical survey. Geologic interpretations require registered professionals.

### **Appendix 4.10 Soil Boring Logs**

#### *General Comments*

1. Include a cover sheet with explanation of logs and USCS. This is a standard form used by many consultants.
2. Because soil boring logs, well logs, and well construction logs are included in this Appendix the title should be changed to Soil Boring/Well Completion Logs.
3. Per the text the Unified Soil Classification System (USCS) was used to describe soil samples. Grain size terms such as “pebbles” and “very fine sand” are used but are not a grain size distribution term according to the USCS.

4. Several borings (borings B1, B2, B3, B4, B8 ) are mapped within the limits of the landfill however there is no indication that waste was encountered in the continuous soil samples collected from the borings (B2 had possible landfill material” indicated on the log).
5. Pursuant to the report a groundwater samples was collected from several borings. However, this is not indicated on the logs, nor is there any indication of groundwater on the log. In fact, there is not indication of saturated soil encountered. The moisture content of the samples is described as ranging from moist to very moist.
6. The text states that soil samples were field screened for VOCs using a PID. However, there is no indication on the logs of the results of the field screening.
7. The logs indicate that the boring was backfilled with bentonite grout to within 1 foot of the surface than with one foot of “existing soil”. The soil boring permit application states that the borings will be backfilled with bentonite and makes no reference to the use of “native soil”. Does the method used to backfill the soil boring conform to the permit requirements?
8. The drilling company listed on the logs is H&P Mobile GeoChemistry. The drilling contractor listed on the soil boring permit application is WestHazMat Drilling. Was the DEH notified of the change in drilling companies?
9. Per text the Unified Soil Classification (USCS) was used to describe soil samples. Grain size distribution terms such as Well Sorted are used but is not a grain size distribution term according to the USCS.

*Specific Comments per log.*

Boring B1

1. Soil between depths of 8 to 10 feet is classified as a Clayey Silt (ML). However description is a SILTY fine to very fine SAND. Pursuant to the USCS this soil would be a Silty Sand (SM).

Boring B2

1. Soil between depths of 2 to 6 feet is classified as a ML. However description is a SILTY fine to very fine SAND. Pursuant to the USCS this soil would be a Silty Sand (SM).

Boring B3

1. Backfill Log indicates that upper foot of borehole was backfilled with “existing soil” but notation at bottom of log states that borehole was capped with asphalt (or is it asphaltic concrete?).

#### Boring B4

1. Backfill Log indicates that upper foot of borehole was backfilled with “existing soil” but notation at bottom of log states that borehole was capped with asphalt (or is it asphaltic concrete?).
2. Soil between 13 to 20 feet is described as fine to coarse sand by given the USCS classification of SP, a poorly graded sand, which would not be a sand that ranges in grain size from fine to coarse.

#### Boring B5

1. Soil between 6 and 20 feet given USCS classification of SP but discrete samples were described as Silty Sand (SM) and Clayey Silt (ML).

Did not review remaining logs.

#### Appendix 4.11

Chain of Custody on page 3 of 149 indicates that samples were relinquished by Karen Stackpole on 7/28/04 at 16:44 and received at the laboratory on 7/29/04 at 08:30. Who was in possession of the samples between the time that they were relinquished by Karen Stackpole and received by the laboratory?

Chain of Custody 27663 on page 49 of 149 indicates that samples were relinquished by Karen Stackpole on 8/9/04 at 17:00 and received at the laboratory on 8/10/04 at 08:30. Who was in possession of the samples between the time that they were relinquished by Karen Stackpole and received by the laboratory?

Page 70 of 149 there is a QA for surrogate recoveries for SVOCs. There are six reported surrogate recovery concentrations. Two are below the concentration limits, two are at lower concentration limits, and two are near the lower end. How does this effect the data?

Page 23 of 149, 76 of 149, and 100 of 149 lists LCS and LCS Dup concentrations as part of the QA. Why is the column titled LCS RPD % limit blank?

Chain of Custody 22257 on page 78 of 149 indicates that samples were relinquished by Karen Stackpole on 8/10/04 at 16:00 and received at the laboratory on 8/11/04 at 08:50. Who was in possession of the samples between the time that they were relinquished by Karen Stackpole and received by the laboratory?

Chain of Custody 21168 on page 79 of 149 indicates that samples were relinquished by Karen Stackpole on 8/10/04 at 16:00 but has no signature indicating receipt by lab. This should be amended and explained.

Page 99 of 149 there is a QA for surrogate recoveries for SVOCs. There are six reported surrogate recovery concentrations. Two are below the concentration limits, two are at lower concentration limits, and two are near the lower end. How does this effect the data?

Chain of Custody 21172 on page 108 of 149 indicates name of the sampler (cannot read signature) who signed as collector on 10/13/04 at 13:28. However, there is not signature for the samples are relinquished. The Chain of Custody indicates that the samples were received at the laboratory on 10/14/04 at 08:45. The Chain of Custody should be revised to clearly indicate who collected the sample, when the samples were relinquished by SCS, and if there is a time gap between the time when the samples were relinquished by SCS and received by the laboratory who was in control of the samples.

Chain of Custody 21173 on page 126 of 149 indicates name of the sampler (cannot read signature) who signed as collector on 10/14/04, but did not put down the time. There is not signature of when SCS relinquished the samples and the laboratory did not sign the Chain of Custody that they received the samples. It appears that the sample names were in error and this Chain of Custody was faxed to the laboratory to correct the error. The report should contain both Chain of Custodies. If the original Chain of Custody is not properly completed it should be amended.

#### **Appendix 4.12**

Chain of Custody indicates that samples were relinquished by Karen Stackpole on 6/16/04 at 17:00 and received at the laboratory on 6/17/04 at 08:40. Who was in possession of the samples between the time that they were relinquished by Karen Stackpole and received by the laboratory?

Chain of Custody stated that the preservative used was "cool". The soil boring permit application states that the method used to preserve samples would be to place them in an ice filled chest. There appears to be a difference between the methods used to preserve the samples as stated in the soil boring permit application and on the chain of custody. Was there a difference? If not please provide documentation that the preservation methods were the same.

#### **Appendix 4.13**

Chain of Custody 28882 on page 3 of 20 indicates that samples were relinquished by Karen Stackpole on 8/3/04 at 13:00 and received at the laboratory on 8/4/04 at 08:45. Who was in possession of the samples between the time that they were relinquished by Karen Stackpole and received by the laboratory?

The Quality Control data on page 8 of 20 does not include acceptable LCS/LCS Dup and LCS RPD % Limits. Please explain.

Pages 15 of 20, 17 of 20, and 18 of 20 lists LCS and LCS Dup concentrations as part of the QA. Why is the column titled LCS RPD % limit blank?

#### **Appendix 4.14**

Chain of Custody 27515 on page 3 of 39 indicates name of the sampler (Keith Etchells) who signed as collector on 9/13/04, but did not put down the time. There is not signature of when SCS relinquished the samples. The laboratory signed as received on 9/14/04 at 08:30. The Chain of Custody should be properly completed. If there is a time gap between the time when SCS relinquished the samples and the Laboratory received them an explanation should be given as to who was in control of the samples.

Chain of Custody 27515 stated that there were no preservatives used to for these samples. As stated in the Soil Boring Well Installation Permit Application the samples were to be preserved by placing them in an ice-filled chest. Why was this not followed?

There is a comment on pages 16 of 39 and 19 of 39 that they used "higher PQL due to matrix". How does this effect data?

Chain of Custodies on pages 22 and 23 of 39 indicates name of the sampler (Keith Etchells) who signed as collector on 9/14/04, but did not put down the time. There is not signature of when SCS relinquished the samples. The laboratory signed as received on 9/15/04 at 08:40. The Chain of Custody should be properly completed. If there is a time gap between the time when SCS relinquished the samples and the Laboratory received them an explanation should be given as to who was in control of the sample.

Chain of Custodies on pages 22 and 23 of 39 stated that there were no preservatives used to for these samples. As stated in the Soil Boring Well Installation Permit Application the samples were to be preserved by placing them in an ice-filled chest. Please explain.

#### **Appendix 4.17**

There is not time listed for sample collected from well SCS4.

#### **Appendix 8.6**

On page 3 of 4 there is a reference to Table 8.6.1 and 8.6.2 and on page 4 of 4 there is a reference to Table 8.6.4. The convention appears that the first two digits of a Table refer to the Appendix in which it is located. None of these tables are included in Appendix 8.6. However there is a Table 8.5.2 in Appendix 8.6. I am confused.

#### **Appendix 8.7**

Table 8.7.1 lists the lead in soil/dust concentration as 10.1 ug/g. Table 8.2 (text) lists the EPC for lead at 0-5 feet as 10.4 mg/kg, which is the same as 10.4 ug/g. Which one is correct? Does the calculation need to be redone?



Barry Pulver, PG

The initial email comment was addressed in September 2005 and revised tables 4.22 and 4.23 were sent to the TAC in pdf format. These revised tables are included as attachments to this document.

#### **General Comments**

1. This comment is addressed in response #4 to the comments of Dr. Huntley.
2. The outline of the landfill operations shown on the figures is based mainly on the interpreted extent of disturbance shown on aerial photographs taken in the 1957-1960 period. It is likely that this outline includes areas in which there was no actual disposal of buried waste. Aerial and ground photographs show that large portions of the area within the boundary were used for stockpiling of various types of waste material. It is not known whether burial of waste occurred in these areas of the landfill operations. In some areas included within the outline of landfill operations, aerial and land photographs show that elongate trenches were excavated and filled with waste. Such areas were noted in the late 1950s photographs of western portion of the landfill. It is possible that the soils between these trenches were not excavated. It is likely that some portions of the area of surface disturbance resulting from landfill operations were never used for the subsurface disposal of waste. Such areas may have been set aside for future use or may have been used mainly as staging areas.

This comment is also partially addressed in response #10 to the comments of Dr. Huntley.

3. Some small adjustments were made to the location of the boundary, notably just to the east of the boat basin.

#### **Section 1**

4. The other environmental investigations being conducted at Mission Bay but did not alter the planned investigation.
5. A table of the main personnel involved in the study is included as an attachment to this document.

#### **Section 2**

6. p.2 A discussion of the changes in the SCM will be included in the final report.
7. We will insert a footnote to clarify the meaning of the term monitoring well at its first usage in the report.

#### **Section 4**

8. p.38 This comment is addressed in Appendix 4.22 and in the responses #6 and #7 to the comments from Mr. Sarabia.

9. Appendix 4.22 is provided as an attachment to this document.
10. The editorial change will be made.
11. Samples DP1 through DP4 are water samples collected from the drive points installed in the sediments of Mission Bay and the San Diego River.
12. Appendix 4.22 is provided as an attachment to this document.
13. p.40 The community and on-site personnel health and safety plans were provided with the addendum to the workplan.
14. The change will be made.
15. Air monitoring data collected by SCS and the AQMD are already included in Appendices 4.6, 4.7, and 4.8.
16. p.58 The logs will be reviewed and revised for consistency with the USCS.
17. p.61 Members of the TAC specifically requested that all data collected be compared to standards such as the PHGs, Ocean Plan, and PRGs. We agree with your statements, but we included the comparisons in response to the TAC request.
18. p.70 The attached table shows the depths of the pumps and the approximate depths of the halocline, which is a gradual transition in several of the wells. The majority of the pumps appear to be set below or in the lower part of the transitional zone. Our hydrogeologist with expertise in low flow groundwater sampling states that pumps draw water from a range of depths even at low flow rates, so it is likely that mixing did occur during sampling and the samples are not representative of only one zone of groundwater. However, it would be a good idea to raise the pumps prior to the next regular sampling event so that the data could be compared. Any decisions regarding subsequent work should be reserved until after the comparison is conducted.

It should be noted that this does not apply to the metals data, because these samples were collected with single-use bailers from the shallow part of the water column in each well.

19. p.79 A revised report has been requested from the surveyor and will be included in the final report.

## Section 6

20. p.91 Please see the response to Mr. Pulver's comments #1 and #2. The absence of waste does not indicate that the boring was located outside the area disturbed during former landfill operations.
21. p.93 This is a simple average.

22. p.96 Yes, samples from borings B14 (located at the edge of the area) and B16.
23. The groundwater levels during the flood events are thought to be affected by the difference in permeability of the refuse, which affects the rate of flow through the different zones.
24. It is our opinion that the new wells filled in the data gaps we observed and that the current well network will provide extensive groundwater data for the site.
25. p.97 The reference should be to Appendix 4.16 and the change will be made.
26. p.100 Please note our response to comment #9 from Dr.Gordon.  
p.118 We agree with your comment. Please note our response to your comment on p.135 in Section 8.
27. p.101 Based on commonly utilized generation models, landfill gas generation declines asymptotically over the years, i.e., it theoretically never reaches “zero”. The EPA-sanctioned model used in this report is consistent with this. It shows that the MBLF is currently generating methane at about 10% of the rate it generated upon closure. It is true that many regulations call for 30-years of post-closure care at landfills, but this is based on the assumption that the small amount of gas still being generated after 30 years will somehow not be significant. However, all landfills (that we are familiar with) that ceased operations 30+ years ago are still, in fact, generating methane. Regulators are becoming cognizant of this, and it is likely that they will require most landfills to continue maintenance and monitoring functions after the initial 30-year post-closure period concludes.
28. p.102 The purpose of this discussion is to provide some level of context to hazardous materials in landfills.

*In order to estimate what might leak out it is important to know what is in the landfill. To a degree, however, it is impossible to quantify everything in a landfill. That is why LFG data is important (specifically VOC content, etc.)*

*“Non-native substances”? Do you mean waste, trash, refuse? This is will be re-worded.*

*I believe if there is a leak from the landfill into surface or groundwater the Regional Board will call it a discharge. We agree that this would be the case if it was a surface/storm water release.*

29. p.103 The point of this sentence was to emphasize that landfills are monitored for what comes out of them (and thereby may potentially degrade public health and the environment), not for what is inside them (which is difficult to ascertain and does not pose a direct threat if contained).

30. p.108 This is an interesting comment, but research regarding fecal coliform is outside the scope of our assessment.
31. p.108 Section 6.6 is a discussion regarding the detailed results which are described in Section 4.13.4. But section 6.6 is on p.104 and you reference p.108, so this may not answer your question.

#### **Section 7**

32. p.111 The list will be revised as you request.
33. p.111 Duly noted. The change will be made.
34. p.111 Duly noted. The change will be made.
35. p.111 Duly noted. The dates will be provided.
36. p.118 The arsenic CHHSL (0.24 mg/kg) is very low compared to normal background concentrations of arsenic in this area (up to 11 mg/kg). Therefore, it was considered that the standard method for arsenic analysis would be suitable because the detection limit of 0.25 mg/kg is substantially lower than the upper range of background concentrations. In addition, the CHHSL is only 0.01 mg/kg lower than the detection limit.
37. This comment seems addressed to the City.
38. p.119 We will better define HAP, VOC, NMOCs, etc. in the report, and rephrase the referenced sentence.
39. We will expand the discussion in this section.
40. We are not aware of regional hot spots of toxic compounds.
41. Good observation. We will rephrase this section as suggested.
42. p.120 Yes. The comment will be repeated in this section.

#### **Section 8**

43. Calculations were checked internally by staff who were independent of the MB HRA project.
44. Groundwater concentrations of contaminants do not change rapidly in the absence of a new source of contamination. If significant contamination has not shown up in the groundwater wells at this point it is unlikely to in the near future. Additional groundwater samples could be collected periodically to confirm this, and there is an ongoing monitoring program.

45. This is addressed in our response to Mr. Pulver's comment #18 in Section 4.
46. p.123 No. However, the OEHHA comments were incorporated into the HRA as appropriate.
47. That is our understanding as the LEA and the RWQCB are the oversight agencies for this landfill.
48. This would be considered a negligible exposure pathway. All pathways were discussed with, and agreed to by the TAC after extensive discussion.
49. p.124 Risk assessment staff were involved in the initial development of the site investigation workplan. Compositing samples is sometimes used to obtain more data at less cost. Composite samples were treated very conservatively in the HRA by multiplying the maximum concentration by the total number of composites. This is consistent with OEHHA's written comments regarding the use of composite soil gas samples.
50. p.125 Agreed. Comment noted.
51. p.125 Setting EPCs equal to the 95% upper confidence limit of the mean is consistent with all federal and state risk assessment guidance. It is consistent with the Precautionary Principle because it uses an upper-bound value of concentration to estimate risk rather than a mean or median value. Thus, it will tend to overestimate risk for most exposed individuals.
52. p.127 Potential construction worker exposure to groundwater, whether via dermal, inhalation, or oral route is a negligible exposure pathway. All exposure pathways were discussed with, and explicitly agreed to by the TAC after extensive discussion before the HRA was conducted.
53. p.132 We agree and will make this editorial change.
54. p.132 We will make this editorial change.
55. p.133 The first row of Table 8.7 is Commercial Worker not Construction Worker. Only the second row contains risk estimates for the Construction Worker.
56. p.134 We will delete "This is unlikely to occur except indoors." and replace with "This is most likely to occur in situations where there is poor ventilation, for example indoors, or in outdoor confined space situations (e.g. trenches, pipes, sumps, etc.)."
57. p.135 No. Hydrogen sulfide and methane can be generated at much larger rates due to the decomposition of organic material in the landfill. This is not true for the other chemicals tested.

58. p.135 The DTSC study did not state any geographic limitations on the applicability of the study. Based on our experience, the California agencies use about 12 ppm as the upper bound of naturally-occurring arsenic throughout California.
59. p.135 No it does not. What it means is that the users of the landfill area (based on our proposed exposure scenarios) would be exposed to about the same level of arsenic-related risk as the average person not exposed to the landfill.
60. p.135 We do not consider it inappropriate to use the Precautionary Principle for risk assessment. We are just making it clear to the reader that there are no references for the approach we have used at this site in applying it. We also do not agree that there is negative editorializing in the risk assessment regarding the Precautionary Principle.
61. According to the PP paradigm, the “action” is the activity that produced or could produce health or environmental risks. The “action” in this case, is therefore development and use of the landfill.
62. As stated in the text, Section 8.5.2., the MB HRA fulfills the responsibility of the project proponent or owner to evaluate the health risks associated with the landfill. The PP states that it is the responsibility of the project proponent or owner to prove that what it is proposing or owns is safe.
63. p.138 The uncertainly analysis section will be revised to include implications for further activities, however, most of this information is included in the recommendations section of the report.

#### **Section 10**

64. p.155 This comment was addressed in our response to Mr. Pulver’s comment #20 in Section 6.
65. p.156 To our knowledge, the SWAT did not have any recommendations for the cap. If the RWQCB had any requirements for the cap, they would have been listed in the WDR for the site. Typically SWATs do not contain recommendations for remediation/closure. At one time, the RWQCBs intended to systematically use SWATs to prioritize their scrutiny of old landfills, but that program ran out of steam (and money) in the early 90’s.
66. p.156 The TAC is already addressing our recommendation in Section 11 regarding the cap thickness.
67. p.157 Utility trench bedding/backfill can be a conduit for gas migration, if they pass through or within the gas “plume” of the landfill. Such trenches can be fitted with a “dam”, a bentonite plug at the location where the trench leaves the methane zone. Drawings of the Site and surrounding area showing the distribution of underground utilities were obtained from the City of San Diego. With the exception of the area



along Sea World Drive and the restrooms near the boat basin, there are few utilities within the South Shores area. Because much of Sea World Drive is located directly above known areas of waste disposal, it is possible that the utility trenches could serve as preferential pathways for the migration of vapors and groundwater from the buried waste. No information was reviewed concerning the depth of the utility trenches or the possibility that buried waste was disturbed during their excavation. An air SWAT was not conducted because it was not required by the local APCD.

68. p.157 Buildings have been safely constructed atop landfills, by use of gas barriers and appropriate settlement protection, or building an elevated structure. There is no reason, based on the data accumulated in this project, to suggest that building atop the MBLF cannot be appropriately mitigated, from a technical viewpoint. The document will be modified to correct any disagreement. We are not aware of methane testing conducted specifically regarding the restroom facilities.
69. p.158 This comment has been addressed in our response to Dr. Huntley's comment #4.
70. p.159 In health risk assessment it is standard practice to compare the results of the risk assessment to the negligible risk benchmark of  $1\text{E-}06$  so that the reader has a frame of reference or basis of interpretation. The risk results for the Mission Bay landfill HRA do significantly exceed the negligible risk benchmark, however, most of the risk is due to a chemical (arsenic) which normally would not have been included in the risk calculations if a background screening had been done. If arsenic were screened out based on background risks would have been much closer to  $1\text{E-}06$ .

#### **Section 11**

71. Section 10 describes the conclusions of the current status based on our assessment, whereas section 11 provides our recommendations for future work. There was no change in heart, just a difference in the scope of the two sections.
72. Mercury is a risk driver, but only for individuals who would be exposed to the deep soils where high concentrations of mercury were found (i.e. construction workers). These soils could be removed if it became likely that construction was actually likely to occur. In addition, construction workers would be protected with the appropriate level of health and safety protection equipment based on contamination levels in the specific area of construction.
73. Additional information was not included in the findings because the existing gas monitoring system is on the Sea World property. We did refer to the system, and suggest that it be expanded.
74. Whether the new wells are added to the existing groundwater monitoring program is at the discretion of the RWQCB.

75. This comment was addressed in our response to Mr. Pulver's comment #18 in Section 4.
76. Low-flow/low-volume methods can be used to overcome many of the limitations created by traditional fixed well volume purging (i.e. purge 3 – 5 well volumes). Low-flow sampling can control sample turbidity (proven to create laboratory artifacts for certain contaminants, even when samples are filtered) and minimize sample chemistry alteration (such as by aeration) by pumping at very low flow rates from the well screen zone, avoiding disturbance to the water column in the well and minimizing stress on the surrounding formation. Also, by pumping water only from the screen zone and not drawing water from the casing above the screen (if present), the volume of water purged to achieve stable water chemistry can be reduced significantly, resulting in lower costs (less time, less waste disposal). Most importantly, however, samples obtained in this manner will best reflect the true groundwater chemistry immediately surrounding each well, rather than a snapshot of the stagnant water trapped inside a well (as in the case of no purge or passive sampling methods) or an average of the water chemistry far away from the well that may be influenced by mobilization of previously immobile particulates or contaminants (in the case of high flow rate/high volume purging).

#### **Figures**

77. Figure 4.2 The data was not added to this figure to avoid congestion but we will reassess the data to see whether this can be done in a way that will produce an effective figure.
78. Figure 6.8 will be revised so that the 15% contour includes the point northeast of B3, using a more distinctive color for the 45% contour, and to edit the typo. We did not add the sample designations as we were concerned that the figure would be cluttered but we will reassess this as in #77. The three contours are dashed in the areas where no control is present.

#### **Tables**

79. Table 4.1. The title in the Table of Contents will be revised.
80. Table 4.6 The titles of Tables 4.6 and 4.7 will be revised. The bold text will be removed from the footnote. There is no regulatory basis for the thresholds listed.

#### **Appendices**

81. Appendix 1.2. The tidal study performed during this assessment indicates that the deeper groundwater is more stagnant than the upper zone, so we are of the opinion that the screening of the wells is appropriate. Any requirement for additional wells would be at the discretion of the RWQCB. It is not our recommendation that additional wells are necessary at this time. A paragraph regarding the storm drains and sewer lines will be added to the text of the report.
82. Appendix 1.3. Duly noted. This change will be made.

83. Appendix 4.5A. Your comments are noted and will be addressed with the subcontractor.
84. Appendix 4.10. A cover sheet regarding the USCS will be included. The title will be changed as requested. The boring logs will be reviewed and revised to address your individual comments and to be in conformance with the USCS. It is standard practice for the surface completion of a boring to reflect the surrounding material (e.g., concrete, asphalt, or soil) depending on the terrain in which the bring was drilled. At the landfill, use of soil for the shallow backfill above the bentonite meant that the surface appearance was similar to that before drilling, and that bentonite was not exposed at the surface.
85. Appendix 4.11.
- First Comment. The samples were in possession of the overnight delivery service between the times that they were relinquished by the field personnel and received by the laboratory.
- Second Comment. The samples were in possession of the overnight delivery service between the times that they were relinquished by the field personnel and received by the laboratory.
- Third Comment. Please see the Data Quality Analysis in Appendix 4.22 for a discussion regarding Mr. Pulver's comment.
- Fourth Comment. This column is left blank because it is a laboratory report default. A relative percent difference (RPD) cannot be calculated unless there is more than one laboratory control sample (LCS).
- Fifth Comment. The samples were in possession of the overnight delivery service between the times that they were relinquished by the field personnel and received by the laboratory.
- Sixth Comment. The COC that is apparently unsigned by the receiving laboratory is actually the second page of the preceding COC which is signed by the laboratory. We will request a signed copy of this second page of the COC.
- Seventh Comment. Please see the Data Quality Analysis in Appendix 4.22 for a discussion regarding Mr. Pulver's comment.
- Eighth Comment. The sample collector (Keith Etchells) who signed the "collected by" section of the COC was also supposed to complete the "relinquished by" field, but did not due to an oversight. The samples were in possession of the overnight delivery service between the times that they were relinquished by the field personnel and received by the laboratory.

Ninth Comment. The sample collector (Keith Etchells) who signed the “collected by” section of the COC was also supposed to complete the “relinquished by” field, but did not due to an oversight. The samples were in possession of the overnight delivery service between the times that they were relinquished by the field personnel and received by the laboratory. The original COC (white copy) did not accompany the samples to the laboratory so the laboratory used the COC duplicate (yellow copy) to authorize receipt. The laboratory sends the original copy of the COC (white copy) to the consultant along with the original lab report and seeing that the original COC was not available they did not send a fully authorized COC with the lab report. Therefore, the fully authorized COC will not reflect the sample designation changes requested. A signed copy of the COC has been received from the laboratory and will be included in the final report.

86. Appendix 4.12.

First Comment. The samples were in possession of the overnight delivery service between the times that they were relinquished by the field personnel and received by the laboratory.

Second Comment. The COC comment of “cool” was only to denote that the samples were placed in a ice-filled cooler. No, the preservation methods did not differ from those stated in the soil boring permit application.

87. Appendix 4.13.

First Comment. Please see the Data Quality Analysis in Appendix 4.22 for a discussion regarding Mr. Pulver’s comment.

Second Comment. Please see the Data Quality Analysis in Appendix 4.22 for a discussion regarding Mr. Pulver’s comment.

Third Comment. This column is left blank because it is a laboratory report default. A relative percent difference (RPD) cannot be calculated unless there is more than one laboratory control sample (LCS).

88. Appendix 4.14.

First Comment. The collector (Keith Etchells) who signed the COC was also supposed to note a time in the “collected by” field as well as complete the “relinquished by” field, but did not due to an oversight. The samples were in possession of the overnight delivery service between the times that they were relinquished by the field personnel and received by the laboratory.

Second Comment. No preservative refers to chemical preservatives. The samples were placed in an ice-filled cooler after collection.

Third Comment. Please see the Data Quality Analysis in Appendix 4.22 for a discussion regarding Mr. Pulver’s comment.

Fourth Comment. The collector (Keith Etchells) who signed the COC was also supposed to note a time in the "collected by" field as well as complete the "relinquished by" field, but did not due to an oversight. The samples were in possession of the overnight delivery service between the times that they were relinquished by the field personnel and received by the laboratory.

Fifth Comment. No preservative refers to chemical preservatives. The samples were placed in an ice-filled cooler after collection.

- 89. Appendix 4.17. The sample time is on the chain of custody.
- 90. Appendix 8.6. This editorial change will be made.
- 91. Appendix 8.7. The correct value is 10.4 µg/g. The Leadsread analysis will be rerun using the value of 10.4 µg/g instead of 10.1 µg/g, however this minor change will result in no change to the risk conclusions regarding lead.

FROM THE DESK OF CHUCK BUDINGER, PG  
GEORGIA WATERSHED ALLIANCE  
1112 CENTER STREET  
ATLANTA, GA 30318

October 20, 2005

**Councilmember Donna Frye**  
**Mission Bay Landfill Technical Advisory Committee, Chairperson**  
**City of San Diego, California**

**Re: Preliminary Comments to the Draft Environmental Site Assessment for the Mission Bay Landfill**

Dear Ms. Frye:

I must commend you on your leadership that resulted in this document as it has been presented to the Committee, and the public, for review. It is through the deliberative process and oversight activities of the Committee that has produced such an excellent report. This report, once all comments are reviewed and incorporated, will serve as a model for the remediation of this particular eye-sore and public health issue in the San Diego area. But, it was through your vision and forethought that brought this report into existence. Thank you.

My review of this report has been short and these comments serve as a preliminary evaluation of the contents and scope of this Draft Site Assessment Plan. This is due to the overall size and content of this report, but also due to another issue that has side-tracked me from the original intentions to review the report with respect to the environmental impacts and public health affects of the hazardous materials disposed of in this landfill.

As a result, I would like to ask the Committee for extra time to review the report in order to evaluate the Site Assessment more fully. The report is very comprehensive and well written, but there are some issues that I would like to have more time to spend evaluating.

The issue that has side-tracked me is the observation of a very serious oversight of the Committee, the public, and the consultant. This includes me during my time on the Committee. There has been no mention of pathogenic bacteria in this report or their impacts on the environment and public health. At the time that I served on the Committee, this was not an issue that seemed to be on anyone person's mind, especially with a landfill that was specifically known to be considered hazardous and later classified as such. However, as a result of the comprehensive scope and deliberate effort to characterize this site, there now appears to be a second-phase health risk associated with



this landfill. Now, due to the nature of the report and its thoroughness, we can look at all issues with a little more clarity.

Certain conditions of the landfill, the surrounding environment and hydrogeology, plus the new understanding that has emerged amongst research institutions and the EPA regarding pathogenic activity in groundwater, leads me to suspect that such a public health risk may exist here. The fact that the Mission Bay Landfill is on the 303 (d) list of impaired water bodies for fecal coliform is the first indication that the landfill may pose an additional threat to the public which the Committee was not aware. Fecal coliform is merely an indicator microbe to detect the presence of sewage in water. If fecal coliform is present, then the entire host of other microbes including pathogenic bacteria, viruses and protozoa, are also present.

Another indication of a potential pathogenic presence within the landfill is the interconnection between Mission Bay and the landfill AND the San Diego River. It seems from several photos and drawings that, at a minimum, there are several former tidal creeks that existed within the landfill boundaries prior to dumping. The Site Assessment Report identified several areas of total saturation within the landfill bottom. The brackish water in these areas also rose and fell with the tides and the underlying hydrology is influenced by flooding from the San Diego River.

Furthermore, the Report reported the likelihood of a bacterial existence within the landfill by observing the continued production of methane and hydrogen sulfide gases. At this late date in the life of this landfill, the strong production of gases should be unusual. The strongest indication is that the highest generation of landfill gases detected by this study was in the areas of total saturation of the landfill bottom, where the greatest communication between Mission Bay and the landfill groundwater exists. The production of "daughter" products of other long-chain chlorinated methanes is another sign of microbial activity.

2

Normally, one of the most common and accepted methods of remediating hazardous waste landfill sites containing organic compounds is to use bacteria to break them down. Pathogens can break these down just as easily and produce the same daughter products and gases. The conditions that make this landfill so susceptible to an invasion of pathogenic microbes is because it is hydraulically connected to an impaired water body that supplies a fresh "dose" of bacteria daily to the subsurface hydrology of the landfill. This almost assures this reviewer that the microbial activity mentioned by the Consultant in this Assessment Report is pathogenic in nature, and could be far worse.

It is understood amongst the scientific community that viruses attach themselves to bacteria, or actually invade their outer shell and "hide" from detection. These are known as bacteriophage microbes. The insidious part of this phenomenon is that once the virus attaches itself to the bacteria of choice, it "convinces" the bacteria to reproduce strands of viral DNA and then extrude them from the bacteria. Some researchers have noticed millions of viruses produced through one E. Coli bacteria. The bacteria then implode or die, but in essence, are no longer detectable in water. There are very few, if any,

detection methods for viruses in groundwater. The EPA estimates that over 40% of all water-borne illnesses in the US occur without ever finding the source of the outbreak.

It is also understood, to some extent that bacteria metabolize by “eating” metal ions. The depletion of metallic species at the outer edge of the landfill could be another sign of pathogenic bacterial activity within the landfill.

To make matters worse, groundwater sampling and analysis for pathogens in water (assuming there is a readily attainable process to detect them) may not be a useful indicator of their presence/absence because they tend to form bio-films on metal objects and around sand grains. So, landfill trash, or subsurface soil samples would have to be collected in order to determine if there is a bio-film and then tested to determine if it contains pathogenic microorganisms.

Of course, this may all be a moot point if the recommendation of the Consultant and the Committee is to incinerate the entire volume of waste and the surrounding soils. But until the Committee decides on a method for cleanup, the water quality of Mission Bay will continue to degrade as a result of a potential “incubator” under the landfill.

This is not the end of the story (Sorry to say). The EPA is now engaged in very serious study of other compounds that have a very questionable affect on the environment and public health, but one that presents very serious implications for the health of the public. In every sewer release, it is now understood that among the bacteria, viruses, protozoa, and other unmentionables, in sewage, there also exist Pharmaceuticals and Personal Care Products (PCPPs). The EPA National Environmental Chemistry Laboratory is researching the health affects of the most common of these compounds such as steroids, hormones, antibiotics, antivirals and a host of other medications (for example, that which is used to treat muscular dystrophy). These compounds are entering into the surface water, and now in the case of Atlanta, Milwaukee and Chicago, the groundwater. None of these compounds can be treated in drinking water facilities once they are discharged from the wastewater facilities into the surface water supplies. In the case of Mission Bay, which is not a drinking water supply source, they enter into the environment with the fecal coliform and other unmentionables and move with the pathogens. The exact fate in open water and in the heat is unknown. Studies have shown them to be persistent in the streams and rivers in more rainy environments, such as Atlanta. The point is, PCPPs are released with the bacteria into the surface water and migrate with them.

My recommendation to the Committee is to continue to focus on the hazardous materials and decide quickly what method of remediation is to be performed to eradicate the hazardous waste. Studies can be done on the bacterial component while the other phases of the Committee’s work are completed, if so desired. Also, it is imperative that the City of San Diego eliminate any residual sanitary sewer overflows and to begin to get a handle on stormwater discharges, which can carry other pathogens such as bird flu and other animal-borne viruses.

I have references for all statements made in this letter. If the Committee wants to know more about this, I can be contacted at 404-447-8982, or by email at [gawatershed@msn.com](mailto:gawatershed@msn.com).

Thank you again for the privilege of serving on this Committee. I hope that more time will be granted in order to complete the evaluation. The work that has been done here is very important and will serve as a model in other parts of the country (like Georgia!)

Sincerely,

Chuck Budinger, PG  
Georgia Watershed Alliance

*Chuck Budinger, PG*

1. Mr. Budinger raises the issue of pathogens in the landfill being a potential human health risk, and notes that pathogens were not addressed in the Site Assessment or Human Health Risk Assessment.

In general human pathogens within a landfill are not believed to be a significant health or environmental issue, especially in older landfills. The primary reasons are that: a) there are only limited potential sources for human pathogens to enter a landfill; b) the conditions within a landfill are very different from those within the human body, and most pathogens are “host-specific”, i.e., they do not survive well outside of the human body, therefore perish in the landfill; and c) there are no clear pathways for pathogens, once in a landfill, to be exposed to the human population.

- Human pathogens can and do enter landfills through human waste products, such as in disposed diapers, medical waste, partially consumed food, or more likely, municipal sewage sludge. This constitutes a very small part of the landfill mass.
- Any pathogens that entered the landfill during its active live (40 years ago) would almost certainly be dead. Literature suggests 99.9% pathogen destruction within days of refuse placement in the un-human-like conditions within the landfill. This is because of the “host-specific” nature of pathogenic microorganisms.
- Yes, the landfill has a great mass of bacteria, but so does normal soil, as well as surface and ground water. These bacteria are rarely pathogenic in and of themselves.
- The methanogenic bacteria in the landfill (which produce the methane) are not pathogenic.
- It is unlikely that the bay is a source by which pathogens enter the landfill – pathogens entering sea water (from surface runoff or untreated sewage) would not survive long and the migration of water through the MBLF is generally toward the bay.
- Pathogens that somehow survive within the landfill are not a threat to the population or the environment. Pathogens typically are affixed to a host and move only when the host moves. They have no mechanism for leaving the site by the air pathway, and it is unlikely they could exist in the cover soils (and be potentially ingested).

2. In addition Mr Budinger addresses “strong production” of methane in the landfill. The rate of generation of gas in the landfill should not be characterized as “strong production”. SCS applied the EPA standard landfill gas generation model to the MBLF, and estimated that the site is generating about 100 standard cubic feet per minute, about 10% of the amount generated at site closure in 1960. Based on commonly utilized generation models, landfill gas generation declines asymptotically over the years, i.e., it theoretically never reaches “zero”. The EPA-sanctioned model used in this report is consistent with this. Despite the low generation, it is not uncommon to see high concentrations of methane both in the landfill and possibly in surrounding native soils (to a limited distance).

## DRAFT REPORT : MISSION BAY LANDFILL SITE ASSESSMENT

Suggested changes in sequence of report sections J. Swink:

1.0 [no change] SCOPE OF WORK

[new 2.0] Old 5.0 HISTORICAL REVIEW (PHYSICAL CHARACTERISTICS)

[new 3.0] Old 7.0 SITE CONCEPTUAL MODEL

Section 7.1.2 [pp. 113-114]: Summary of Landfill History - could be condensed substantially, with a See reference to the more detailed historical background in Section 2.0[old 5.0] : Historical Review (Physical Characteristics).

Sec. 7.1.2.1: Historical Conditions is good as a first paragraph.

Sec. 7.1.2.2 : Landfill Construction, para. 2 could be a second paragraph under 7.1.2 [deleting ref. to 7.1.2.1 & 7.1.2.2], with remaining verbiage from 7.1.2.2 being incorporated into "New" Section 2.0 as appropriate.

[new 4.0] Old 2.0 SITE ASSESSMENT REPORT COMPONENTS

Various sub- section headings in old 2.0 must also be revised to reflect changes in the parenthetic referrals to other sections

[new 5.0] Old 3.0 TECHNICAL BACKGROUND

[new 6.0] Old 4.0 FIELDWORK

[new 7.0] Old 6.0 SITE ASSESSMENT FINDINGS

8.0 [no change] HEALTH RISK ASSESSMENT

9.0 [no change] ECOLOGICAL RISK ASSESSMENT

??10.0 [delete section, fold content into report elsewhere?] CONCLUSIONS -- does not state conclusions but summarizes work plan details from preceding sections. "Conclusions" should summarize the findings, not restate the Scope of Work. Much or all of this material could be incorporated into the Executive Summary or the section: SITE ASSESSMENT FINDINGS, with See references for each sub-section where sub-section content is not incorporated into the SITE ASSESSMENT FINDINGS.

11.0 [no change] RECOMMENDATIONS

12.0 [no change] SELECTED REFERENCES

13.0 [no change] ACRONYMS AND ABBREVIATIONS



*Judy Swink, Mission Bay Park Committee*

One comment by Judy Swink has not appeared in writing. At the November 18, 2005 TAC meeting, Ms. Swink objected to the mention on p. 108 of the need for increased circulation of water in the channel north of the landfill area. She said that the circulation problem has been carefully looked at by various people, and that there is no easy solution (such as repair the culverts under the road). The TAC agreed that we should just delete the offending sentence about increased circulation.

In addition Ms. Swink provided a suggested revised order for the sections of the report by email on November 8, 2005, and at the TAC meeting on December 9, 2005. Much discussion ensued and a revised order was agreed upon by those present. The major revision involves moving the former Section 5 (Historical review) forward to become Section 3 in the final report and moving the former Sections 3 and 4 to become Sections 4 and 5.



**San Diego Coastkeeper  
Mission Bay Technical Advisory Committee  
Draft final report comments  
Prepared by Hiram Sarabia**

The following comments and suggested corrections regarding the Environmental Site Assessment of the Mission Bay Landfill report are submitted on behalf of the San Diego Coastkeeper (formerly the San Diego Baykeeper) by Hiram Sarabia (Technical Advisor).

1. - If any reasonably reliable historical documents indicating the possible contents of the landfill were found I request that they be included in the appendix section of the report and that they be mentioned and referenced in the introduction.
2. - Please list out "phthalate compounds" mentioned in the third paragraph of page one. If these are too numerous to list in the text leave as is but include a reference to where in the report that list may be found.
3. - In the last paragraph of page two, Please list the Mission Bay Watershed Evaluation Study and the Mission Bay Citizen Watershed Monitoring and Education Project as projects conducted by the University of San Diego in partnership with the San Diego Coastkeeper.
4. - Include a table summarizing applicable soil, sediment (if available) and water quality standards for soil, sediment, ground water, etc, with references.
5. - In section 2.1.1, it is mentioned that historical data that were "properly collected and analyzed" were used in this report. Please list the criteria that you employed to select those data.
6. - Please include a statement as to why a Quality Assurance Project Plan was not prepared for this project. If such a document is available please include it in the appendix section.
7. - Please list the Data Quality Objectives that were adopted as part of this project.
8. - Please include a summary of quality control results and any problems encountered during this study.
9. - On the second paragraph of page 18, it states "fieldwork generally followed the protocols established by....Site Assessment and Mitigation (SAM) Manual". What do you mean by "generally", were there exceptions or modifications to this protocol? Please state any changes here.
9. - Identify certified laboratories by name and provide license numbers



10. - On Page 62, it states that results for compounds like benzene and hexavalent chromium in samples were below detection limit. Please explain why you choose these analytical methods, when there are much more sensitive methods. For example, both EPA method 502.2 and 542.2 have method detection levels below 0.05-ug/l for volatile organic compounds and EPA 1636 has a method detection level of 0.23-ug/l for hexavalent chromium.
11. - On fourth paragraph of page 64, please indicate the water depth, if applicable, and depth of coring for the sediment samples collected.
12. - Please include a section on calibration of instruments used in environmental field measurements and include copies of calibration records in appendix section.
13. - In the description of sampling methods please include information on the number of field replicate samples collected.
14. - Was a power analysis conducted as part of the study design and if so please provide the results in the appendix section.
15. - Please describe the sampling design employed, where sampling sites selected randomly?
16. - Where any concentration contour maps generated for metals or other COPC?
17. - Please describe how the "interpreted former location of San Diego river" was delineated.

#### Suggestions for Future Studies:

- Conduct an evaluation of contaminants present in the sediments of the south shores portion of Mission Bay, using the analytical data presented in this report as a guide for choosing parameters to be measured. Collect samples within the delineated area of the interpreted former location of San Diego River and along the central part of the channel south shores channel.
- Include the California Least Tern as an ecological receptor, and other appropriate sensitive vertebrate and invertebrate species, in the tier 2 ERA.

*Hiram Sarabia, San Diego Coastkeeper*

1. The historical documents from the TAC website will be included in the final report as Appendix 3.1.
2. The two phthalates compounds listed in the master data compilation table are bis(2-ethylhexyl)phthalate and di-n-butylphthalate.
3. These two projects will be listed as requested.
4. The ARARs are discussed in Section 1.6 and the numerical values are provided in Tables 4.12 through 4.24 for comparison with each type of data. References are provided in the footnotes to each table. We have not compiled all these numbers into one table as it would involve a lot of different chemicals, but we could do so if you still feel it is necessary.
5. The review process used for the previous data was described in the workplan as follows:

### **2.3 Existing Data Review**

A review and critique of the existing data set was conducted to assess the reliability/usability of the data set. Ten criteria were considered and a determination made as to the reliability of the sample results based on the following:

- 1) if the sampling protocol was available;
- 2) if there was an acceptable description of the sampling protocol;
- 3) if proper sample preservation was followed and proper sampling containers were used;
- 4) if laboratory data sheets were available;
- 5) if laboratory quality assurance/quality control (QA/QC) was available;
- 6) if the QA/QC data was dependable;
- 7) if the sample locations are provided on a Site plan and able to be accurately duplicated;
- 8) if a sample represents one sample location (versus several sample locations, as in a composite sample);
- 9) if the sample was analyzed by a state-accredited laboratory; and
- 10) if the data was collected by "field-screening" (versus laboratory analysis).

Based on these ten criteria, each sample result was placed into a category identifying it as reliable, acceptable, or unreliable. For a sample result to be considered reliable, the first nine criteria listed must be met. For a sample to be considered acceptable, some of the criteria may not have been met. For example, LFG samples were collected on the landfill, but the depth of where the samples were collected within the gas wells was not provided. Because the data set is

limited and some of the criteria listed were met (e.g., sampling procedures, etc), this data was considered acceptable. Data deemed unreliable typically did not meet several of the criteria and have not been considered in this scope of work.

The following sections provide a critique of the data which we believe to be “reliable” or “acceptable.” In the cases where acceptable data is presented, the data are only used qualitatively. Rejected data are termed “unreliable.”

6. A Quality Assurance Project Plan was not prepared for this project because it was not in the original scope, nor required by the agencies which reviewed and approved the workplan. We followed an informal QAPP process in the preparation of the workplan in order to select the appropriate analytical methods for the risk assessment and for the ARARs that we considered appropriate for the project. In addition, a formal QAPP is an expensive document to produce, and we considered it more useful to spend the limited available budget on collecting and analyzing more samples.
7. Again, formal DQOs were not prepared, but we reviewed the available methods and the detection limits that were needed for the risk assessment and ARARs, as well as the need to find appropriate analysis for metals in brackish water.
8. This is included in the new Appendix 4.22.
9. a) The word “generally” is commonly used in reports because of the complexity of many protocols and is not intended to imply that the protocols were not followed. It is our understanding that no specific exceptions or modifications were made to field protocols during this study.  
  
b) These are included in Appendix 4.22.
10. This issue is discussed in Appendix 4.22.
11. Sediment samples were collected from depths of approximately 0 to 6 inches, i.e. immediately below the surface.
12. These are included in Appendix 4.23. We are researching the calibration records for two of the rental instruments used and will provide these documents in this appendix to the final report.
13. This is discussed in the report in section 4.2.1.1 in the draft report.
14. No, a power analysis was not conducted as part of the study design.
15. The landfill gas sampling was conducted using a grid system with random sampling within the grid squares. Other sample locations were selected based on

either professional judgment resulting from historical research (e.g., location of a well at each end of the former location of the river channel), previous sampling locations used (e.g., sediment samples), or to fill in obvious data gaps (e.g., several soil boring locations).

16. No, because no patterns were observed in the data that were suitable for contouring. We would like to know if there is a particular CoC for which you were interested in contours, and in which medium.
17. The location of the main channel of the San Diego River is shown on several maps of the area which are referenced in section 3.1.1. The location of the former San Diego River channel shown on the figures in this report is based on the 1950s aerial photographs obtained from the City of San Diego and the San Diego Historical Society, many of which are included in Appendix C. Aerial photographs from 1951 and 1952 show the location of the former San Diego River channel shortly after the completion of the new channel and levees, but prior to the start of landfill operations. Aerial photographs from late 1953 show that much of the former channel had been filled during expansion of the landfill.

The figures in the draft report show the location of the former San Diego River channel as interpreted from the pre-1952 aerial photographs and maps. Although the former channel appears different in the various photographs, mainly due to changes in the amount of water present in the channel, the general location of the channel remains the same on all the photographs. The figures show the maximum width of the former channel seen on the aerial photographs, although the channel was probably full of water only during high tides. Historical maps, such as the 1859 map issued by the U. S. Coast Survey, show that the former San Diego River channel was in the same general location as observed in the later aerial photographs.

Suggestions for Future Studies: These are both interesting suggestions, but we feel that it is more appropriate for the TAC and the City to respond to them.



# Memo

**To:** Ray Purtee, City of San Diego ESD

**cc:** Mission Bay Landfill Technical Advisory Committee (TAC)

**Date:** 11-21-2005

**Re:** Draft Site Assessment Report for Mission Bay Landfill

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Since attending my first Mission Bay Landfill TAC meeting in June 2003, I have been impressed by the energy and dedication to purpose that each TAC member has displayed. As a Clairemont resident, I feel like my interests are well represented by the oversight that the TAC provides for this project. I have been especially impressed by Ms. Frye's ability to balance the needs of City government, of local Clairemont and Mission Bay residents, and of various community interest groups (e.g., Mission Bay Park Toxic Cleanup) so that all relevant voices have a chance to be heard. Especially relevant, I believe, has been the input by OBGO and Coastkeeper concerning 'big picture' issues having to do with the landfill's historic boundaries, questions related to water and sediment quality to the north of the former MBLF, and the study's overall quality objectives. Technical issues raised repeatedly over the past 12-18 months by Dr. Huntley and Mr. Pulver related to groundwater measurements and field practices appear to be helping the City's consultant focus on producing a final Report that is complete and of acceptable quality.

I have listened with interest to the discussions and summary comments at the last several TAC meetings and have read with keen attention the formal letters provided by Dr. Gordon, Dr. Huntley, Mr. Pulver, and Mr. Sarabia. I certainly agree with these experts that a comprehensive Executive Summary should be added to the Report and I also agree that a number of underlying "data quality" issues must be specifically addressed in detail prior to finalizing the draft Report. In reviewing my own notes of past TAC meetings since 2003, I realize that Mr. Pulver did not join the committee until April 2004, at which time the consultant's work plan was almost complete. Further, when Mr. Sarabia began attending the TAC meetings in January 2005, the consultant's field work was complete (or nearly so). I suspect that this chain of events is largely responsible for the possible omission from the work plan of a "quality assurance plan" and of written "data quality objectives." Never the less, I agree with Mr. Sarabia's points #6 and #7 and similar points made by Mr. Pulver that the consultant's report should discuss in much greater detail these apparent omissions and should explain how their absence affects the findings of this study. As a City resident, I am certainly hopeful that the omission of these quality assurance elements will in no way imperil the validity of the findings provided in the draft Report.

At a much more fundamental level, Dr. Huntley's written comments #3 and #4 nicely summarize the present difficulties with what I believe are the single most important portions of the consultant's findings – a meaningful and thorough discussion of "hotbutton" issues" and "big questions." I agree completely with the spirit of Dr. Huntley's review comment, namely that the consultant's final Report must clearly and completely address both the "hotbutton" issues" and the "big questions" that he points to and must discuss in detail an answer to the question of "where did all the chemicals go?" If the final Report does not do so, then the City will have failed in its most basic goal – to determine once and for all whether the former MBLF site poses a significant threat to users of Mission Bay and to then communicate those facts to City residents in a way that is unambiguous and defensible.

To this latter question (i.e., of defensibility), I am particularly troubled by the concerns raised about data quality issues and about the draft Report's completeness. Since the draft Report concludes that minimal health or ecological risks exist at the MBLF site, and since this finding is so unexpected (from this layman's perspective, at any rate), I am honestly concerned that technical inadequacies raised by expert TAC members will result in the final Report's conclusions being disregarded at some point in the future by other interested parties. That is the bad news. The good news is that the four reviewers listed above have already submitted written comments that clearly point the way for the City's consultant to address the deficiencies present in the draft Report. As a City taxpayer and nearby neighborhood resident, I urge City ESD staff to carefully monitor revisions to the draft Report so that all of the expert TAC members' comments and concerns are fully and completely addressed in the final Report.

During the coming holiday season in November and December and well into the new year, my personal schedule will not permit me to attend TAC meetings with the regularity that I have enjoyed during the past 2½ years. By the time that I can again resume attendance at the TAC meetings, I suspect that the final Report will already have been issued. Should you or other ESD staff wish clarification or elaboration for any of these points, you should feel free to contact me at [fields\\_family77@sbcglobal.net](mailto:fields_family77@sbcglobal.net) or by mail at the address below.

Thank you again for your conscientious efforts as the MBLF project manager. I look forward to reading the results of your efforts when the study's final Report is issued.

Respectfully,

John and Diantha Fields  
3233 Karok Avenue  
San Diego, CA 92117

*John and Diantha Fields*

We appreciate your comments and think that they have been answered in our responses listed under the names of Dr. Huntley, Dr. Gordon, Mr. Pulver, and Mr. Sarabia. Your astute observations in the second paragraph regarding the history of the TAC and its personnel were most helpful in understanding of the development of various issues. We are grateful for your contribution.

Mission Bay Park Toxic Cleanup  
P.O. Box 122807  
San Diego, CA 92112-2807

Chair Donna Frye  
Mission Bay Landfill  
Technical Advisory Committee  
202 C Street  
San Diego, CA 92101

**FOR DISTRIBUTION**

January 30, 2006

**Subject: Comment Letter - Mission Bay Landfill Site Assessment Report**

The City of San Diego's military toxic waste dump in the South Shores of Mission Bay Park was an unfenced, unlined, and unregulated toxic recipient of millions of gallons of toxic waste in the 1940's and 1950's. For years, it was the city's only operating Class 1 dump for toxics.

Past officials denied the toxic dump's existence. Current officials chairing and running the TAC, and supervising the site, contradict evidence the unlined site leaks through every pathway, and deny the relevance of its history of releases.

**SCS Engineers' site study is fatally flawed -- it ignores scientific protocols at every level.**

Its failures, from ill-conceived planning to faulty implementation, leave the public exposed to high risk from the dump's contaminated cap, soil, plumes, gas pockets, and unimpeded releases.

The study also failed to address the bio-accumulation of heavy metals and pesticides in Mission Bay and San Diego River fish and invertebrates. This is a serious health threat to both the humans and park endangered species that ingest them.

City records, historical aerial photo banks, and scientific studies submitted to TAC evidence unrestricted barrel- and surface-dumping throughout South Shores. Knowing this, City and SCS staff arbitrarily limited toxic tests to the "map" of an old garbage landfill. This violates the Technical Advisory Committee mission statement to find the "horizontal extent" of toxins.

To date, SCS has refused to produce an executive summary. After months of TAC member requests, SCS submitted two pages of pull quotes from the draft as their executive summary. This is bad science.

A

B

C

D

The following study comments must be considered preliminary until the stated conclusions of an executive summary are provided to TAC members:

- 1) Soon after getting the contract, SCS canceled all promised trenching, which precluded exposing hazardous sewage ponds revealed in aerial photos and city documents. SCS announced they were reducing push probe tests by 40%, and "unable to test" half bay sediment sites as well as an area near the river with extreme background levels.
- 2) SCS and the City site supervisors running TAC refused to contact for interview the responsible parties who dumped toxic waste -- Solar, Convair, Ryan, Rohr, and the U.S. Navy among many others. Scientific investigators always start a site assessment by contacting the corporations who dumped the toxics. TAC members, tasked with protecting the lives and health of thousands of parkgoers, still have little idea who dumped how much of what, when and where.
- 3) Forsaking scientific method, SCS shunned mandates to test to standards, provide split samples, repeat sampling to verify results, use new tubes to avoid contamination anomalies, or adjust results to twice daily tidal flushing. Air sampling, in a dump known to produce gases, was totally deficient in method and extent.
- 4) Drastically limiting accurate assessment of site toxins, and repeating the flawed Woodward Clyde mistake, SCS refused to test near high magnetometer reading locations.
- 5) Departing from scientific protocol, SCS Engineers canceled a promised Quality Assurance Program (QAP) requested by Baykeeper.
- 6) SCS and City TAC staff passed over requests to agendize the Environmental Protection Agency Site Assessment, a more current, accurate evaluation than the Woodward Clyde study data rehashed by SCS to the exclusion of numerous available area tests.
- 7) Re the human health risk assessment, SCS found that cancer and non-cancer risk drivers arsenic and mercury are at "high" and "very high" soil levels, exceeding from 200% to 400 % the safe hazard quotient of 1. Vanadium is elevated. SCS refuses to say if these levels are safe for human exposure, especially in children. The City and SeaWorld are building public use facilities in the area to attract people. Their expert, SCS, refuses to declare any public risk from a site where the cap is contaminated, chemical plumes are common, and large gas pockets are produced.
- 9) SCS and the City refused to fence the site, even when the cap was penetrated during testing, and refused to post a Prop 65 warning for the carcinogens listed in the Woodward Clyde study.
- 10) For five months, SCS and City TAC staff deliberately chose to withhold from TAC members letters from two state of California regulatory agencies. The letters were critical of SCS's scope and methods. SCS failed to implement the full recommendations of OEHHA and the CRWQCB. For instance, rather than test southeast Fiesta Is. for background levels, the City chose to establish none. During the five month coverup, SCS did their tests and SeaWorld began a major expansion.
- 11) The SCS report lacks a complete list of sampling, testing, and lab personnel, and their qualifications and experience.

- 12) SCS failed to retest documented plume and gas hotspots outside the landfill map under the SeaWorld leasehold. City TAC staff then asked TAC to endorse SeaWorld mitigation projects outside TAC purview.
- 13) SCS virtually ignored the SAIC study, which established dump releases as the source of bay sediment contamination, and detailed extremely high levels of heavy metal releases.
- 14) SCS and city staff refused to review documents pertaining to the site's history, even though the city's paid document researcher collected an 88-page index re this site.
- 15) SCS paid no heed to calls for the document researcher to present a report.
- 16) SCS was deaf to calls from a host of environmental groups to determine the true horizontal extent of the dump, namely that portion beneath SeaWorld, where photos, studies, eye witnesses, and documents prove the existence of sewage waste, toxic plumes, and deadly and explosive Hydrogen Sulfide and Methane gas.
- 17) The Mission Bay Landfill, if it were just an illegally-unlined garbage dump, presents possible bacterial and viral health threats, as TAC member Budinger notes. By ignoring unposted toxic Thallium releases, garbage seepage, and human health complaints from area triathletes, the SCS study fails to adequately test surface waters.
- 18) The chair requested that MBPTC provide data on the dump, then joined SCS in *rejecting* the alarming professional scientific studies done by Targhee Environmental Inc, and SWAPE LLC, as submitted by California Earth Corps and the Sierra Club.
- 19) SCS declined to interview a dump site supervisor, who stated on video that "everybody, including the Navy, dumped everything everywhere in South Shores". This honored retiree also rescued a young girl caught in a sewage pond under where SeaWorld sits.
- 20) SCS and City staff failed to notice the study to recreational stakeholder user groups and area residents. Kept off the committee were County Health, Park and Rec., US Fish and Wildlife, Fish and Game, and the Coast Guard.
- 21) SCS neglected to test this site -- long known to be a military toxic waste dump -- for radioactivity.
- 22) As a nursery for the sport fishing industry, Mission Bay is dying. SCS did no bioassay of bordering water bodies -- not in Mission Bay or the San Diego River.
- 23) Despite a budget of \$650,000, SCS refused to computer map known plumes, airborne exposure outside of the city landfill map, or two dump flooding episodes.
- 24) SCS did no public health survey of the reported cancer cluster downwind in Bay Park.
- 25) In violation of the Precautionary Principle, instead of testing for all of the EPA Site Assessment's sixty-eight site Priority Pollutants, SCS and City Environmental Services staff restricted their study to a short list of COPCs.

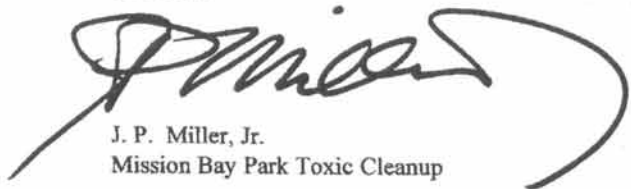


- 27) SCS made little or no effort to examine degradation rates, discuss other studies, reconcile estimates, establish release source hotspots, detail clean up options, provide park land use guidelines, retest release sites, or acknowledge the risk to people of millions of gallons of toxics never remediated.
- 28) SCS refused to provide TAC with a requested list of applicable toxic standards, or to address the city and water board's failure to require any health and regulatory standards in the site monitoring program.
- 29) SCS ignored TAC staffer John Lamb's three part Union Tribune investigative report on the dump, as well as the San Diego Reader's cover story "Something Stinks in Mission Bay."
- 30) SCS refused to study the marine food exposure pathway in the human health risk assessment.
- 31) The chair and SCS refuse to discuss the tier two study both have mentioned.

The gross deficiencies and bad science detailed herein leave unprotected park visitors, employees, and neighboring residents. The study in no way elucidates the true threat of the next release from the Mission Bay dump.

TAC members, responsible for human health and safety, should not sanction this substandard study of a toxic time bomb.

Sincerely,

A handwritten signature in black ink, appearing to read "J. P. Miller, Jr.", with a large, sweeping flourish extending from the end of the signature.

J. P. Miller, Jr.  
Mission Bay Park Toxic Cleanup

cc: John Robertus, CRWQCB  
City Attorney's Office

*James Miller, Jr., Mission Bay Park Toxic Cleanup*

- A. We do not agree with your assessment of our study, which was conducted in a scientific and professional manner.
  - B. The bio-accumulation of heavy metals and pesticides in Mission bay and San Diego River fish and invertebrates was outside the scope of our contract.
  - C. SCS conducted the study within the guidelines we were provided. The substantial review of photographs, maps and other historical documents was not restricted to the limits of the sanitary landfill and information on other areas in the vicinity was considered as discussed in Section 5 of the draft report.
  - D. SCS provided a draft executive summary on December 9, 2005, almost two months before this comment letter was written. The executive summary will be revised as discussed in the cover letter. However, it is a summary of the report and will not include information that is not discussed in other parts of the report.
1. During the interview, we were requested by TAC members not to conduct trenching at the site due to events during the building of the boat basin. Additional "direct push" soil borings, not proposed in the workplan, were installed in the landfill as a result of discussions at technical subcommittee meetings. The bay sediment sites were not sampled because true background samples are not present in the area. SCS elected to use the more conservative approach of not comparing samples to background, but analyzing all the data.
  2. Interviews of such entities were not part of the scope of our study.
  3. SCS has no record of verbal requests in our TAC meeting notes, nor did we receive any written requests for split samples. We analyzed samples and compared to standards as discussed in the report, and used standard procedures for sampling to avoid cross-contamination of samples. We do not agree that our landfill gas, and other air, sampling was deficient.
  4. Soil boring B14 was installed near an area of higher magnetometer readings.
  5. The QAP was requested by Coastkeeper personnel after the fieldwork had been completed. As previously discussed, appropriate procedures were followed to obtain reliable data.
  6. Setting the agenda of TAC meetings is not within the scope of our study.
  7. The HRA did indeed find that arsenic concentrations in soils of the landfill contribute excess cancer risk to potential users of the site. However, because the arsenic concentrations are mostly within the range of typical background

concentrations of arsenic in California these risks are within the range of risks most people experience naturally throughout California. The California Environmental Protection Agency does not require remediation of naturally occurring chemicals below background. Nonetheless, it is always desirable to reduce exposure to cancer-causing chemicals to the extent feasible and arsenic exposure at the landfill could be reduced further by capping the site with cleaner soil or excavating and removing soils containing higher concentrations. Mercury concentrations were very high in a few locations in very deep soils which only construction workers would be exposed to so these concentrations would not pose a risk to casual users of the area. The HRA also noted the high concentrations of methane gas in the landfill, pointing out that these levels exceed safe building standards. Finally, the HRA also pointed out that although hydrogen sulfide was found only at low concentrations in the landfill gas and would not pose a hazard to casual visitors to the site, it is possible that pockets of high concentrations exist deeper in the landfill. Opening of these areas during construction may create a health hazard to construction workers. These health risk conclusions are clearly stated in Sections 8.6.1, 8.6.2, 8.6.3, and 8.6.3 of the Draft HRA.

8. There is no #8 comment in the letter we received.
9. Fencing of the site, which is a public park, is the purview of the City, and would probably require a land use change. Appropriate steps were taken to protect health and safety during the study, as discussed in the health and safety plans.
10. SCS included the recommendations of the reviewing agencies in the assessment, as appropriate. The lack of background samples is addressed in our response to Mr. Miller's comment #1.
11. A table of SCS personnel has been included as an attachment to this document.
12. Retesting of former sampling locations was not included in our scope. The issue of high concentrations in the Sea World parking lot is addressed in our response to Dr. Huntley's comment #6.
13. SCS reviewed the SAIC study during the review of historical documents, and had internal discussions regarding the chemicals reported.
14. We do not recall refusing to review any documents regarding the site. Please be more specific.
15. The report of the document research is provided in the workplan, and much of it is repeated in the report and its appendices.
16. The response to this comment is the same as that to Mr. Miller's comment #C.

17. Sampling and analysis of surface waters were not included in this study because there are many possible sources of contamination in surface waters. This study was specifically designed to address the contribution of the landfill. The issue of elevated thallium concentrations has been addressed in an attachment to this document.
18. SCS attended the meeting at which these studies were presented, and discussed the data with the presenters. SCS obtained copies of the photographs presented at this TAC meeting for further study. These reports were considered in preparation of Section 5 in the Draft Report.
19. Interviews of such personnel were not part of the scope of our study.
20. The general public and all potentially interested parties would have been aware of the study due to the attendant publicity. In addition, two large signs were posted at the park, one close to the entrance from Sea World Drive, and one near the boat basin ramp. The meetings of the TAC are open to the public, and we are not aware that anyone was specifically excluded from membership of the TAC.
21. The suggested testing is outside the scope of the current study. The TAC could discuss whether such a future study is warranted.
22. The suggested bioassays are outside the scope of the current study. See the response to comment #17.
23. The groundwater analytical data were not appropriate for contouring. Maps were generated on groundwater elevations before, during, and after the flood events. Airborne exposure outside the landfill was studied by the APCD, and their report is included as an Appendix to the draft report.
24. The work is outside the scope of the current study.
25. The list of analytes tested was based on our review of historical data for the site.
26. There is no #26 comment in the letter we received.
27. Degradation rates are discussed in our response to Dr. Huntley's comment #4. Other relevant studies were reviewed prior to preparation of the workplan. Recommendations have been made to address issues that we found during our study. Retesting of locations was not included in our budget.
28. The applicable standards are discussed in the report (section 1.6) and provided in Table 4.12 to 4.24. Additional standards were added for comparison purposes at the request of the TAC. Addressing health standards in the site monitoring program is not in the scope of our contract.

- 29. This article was included in the review of historical data.
- 30. The marine pathways would be included in a Tier 2 study if conducted.
- 31. SCS is willing to conduct a Tier 2 study if requested to do so by the City.